

Epistemology Shock: English Professors Confront Science

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The *shock* of our title was precipitated by our diverse yet eerily congruent experiences as English professors teaching courses where we were confronted by students, colleagues, and dispositions entrenched in scientism, scientific disciplines, and a science-based understanding of the world. These confrontations, rooted in the continuing legacy of 18th Century Cartesian constructions of a mind/body duality, resonate with current STEM initiatives, with calls within our own field of rhetoric and composition for more quantitative scholarship to justify the field itself, and with the privileging of empirical research and science methodologies in the academy in general and elsewhere. An exhaustive list of examples of this encroachment would be impossible here, but the ones that impact our work most immediately include increasing demands for quantitative assessments of the programs and courses we teach; the exponentially accelerating imperatives of standardized testing in the K-12 schools that prepare our students; and the research grants we apply for whose applications insist on “executive summaries,” “deliverables,” and discussions of methodology, and assume equipment use as a major expenditure—concepts and research frameworks from business, science, and the social sciences that are often alien to our work as humanities scholars. And, indeed, these privilegings of science and scientific methodologies, these demands for numbers and “facts,” cannot be separated from the current denunciation of

“alternate facts” by liberals, however convenient it might be to imagine that some appeals to facticity are more righteous than others.

These are the contexts that we recognize form and impact our places in the academy and our work as teachers based in an English Department but working with students in many disciplines. Although we do gesture to some pedagogical possibilities at the end of this article, our purpose here is not primarily to pose classroom solutions for this privileging of science methodologies—the result of a science/humanities duality—but rather to excavate the ways in which this disposition manifests itself in our classes and impacts our students and us as English teachers, challenging our disciplinary/disciplined ways of thinking, writing, reading, teaching; and to think through the implications and consequences of these challenges.

As rhetoricians and scholars trained in the disciplines of English, and as college English teachers, we both value close critical readings of facts and figures; we believe that all discourse constructs and disseminates values, assumptions, and ideologies; we see qualitative research as an integral component of any project that claims to gloss human and non-human cultures; we connect reading and writing to understanding self and others, to empathy, to inquiry in a broad and open context. Yet the calls for “randomized control studies” suggest that such connections must be quantified, must be scientifically “validated,” that storytelling (whether fictional or nonfictional, novelistic or essayistic) as a means of making meaning is suspect, that “data” and “outcomes” and “measurement” is the only way to investigate and educate. Somehow, the very idea of liberal arts, of broadening a human being’s experiences and knowledge rather than “training” them for a profession, is suspect. What are our graduates going to do with a degree is

often the question. We, on the other hand, wonder who they are going to be. But is such a question even possible in this climate of big data and empirical studies and scientific methodologies?¹ And how do we avoid giving ourselves over to be cogs in a wheel that appears to be grinding every more steadily toward a focus on “objectivity,” toward a scientism that has been roundly challenged by the humanities for centuries? Can our discipline continue to work with the subtle ways knowledge is produced and challenged if data mining is “becom[ing] the methodological norm in Humanities research” (Braidotti 4)?

The World of Fact

Ian has been teaching an interdisciplinary upper division course with a critical animal studies theme, while Jan has been co-teaching a series of courses with a colleague from economics. In both cases, our courses have attracted students from a variety of majors, and we have struggled to effectively address students who parade “facts,” “truth,” and the scientism that frames their disciplinary training to counter the world views and assertions forwarded by our humanities-informed texts and methodologies that value experience as evidence and that see the insights that artistic creation offers our understandings of “reality.” Often these students are completely uncritical of scientific discourses, treating them as transparent and factual, seemingly unaware of the ways in which these discourses are as much constructed as any other discourse, and of the critiques of scientific pretensions to objectivity that have been made by feminists, queer theorists, critical race theorists, critical legal scholars, poststructuralists, and even some

scientists over the past half a century (Thomas Kuhn's *The Structure of Scientific Revolutions* celebrated its 50th anniversary edition three years ago).²

Ian's critical animal studies course attracts students from a variety of majors, some of whom are simultaneously taking a course on evolution. The scientists, biologists, computer scientists, and business majors in the group are the most reluctant to abandon ideologies of scientific fact and objectivity, an unfortunate reflection on the other courses they are taking, or, at least, on their inability to assimilate in the short term ideas they are confronting in those courses that counter conventional wisdom about science, facts, and objectivity. A central tenet of Critical Animal Studies holds that the human/non-human animal divide is a historically and culturally specific construction, and that the representation of non-human animals across media and in and through human imaginations plays a pivotal role in undergirding this construction (see, e.g., DeMello).

Common tropes deployed to maintain a human/non-human animal hierarchy include those that draw on measurements of reason, intelligence, and self-consciousness in order to justify assertions of humans' relatively greater achievements and worth compared to other animals, and, some would argue, to rationalize humans' mistreatment of other animals. Some students in the class are simultaneously taking a course on evolution, and these, as well as other class members, seem non-plussed at Ian's suggestion that designations of intelligence are not objective, and that depending on the criteria used, one could come to different conclusions about who or what is "intelligent" (never mind the question about whether intelligence should be a criterion for value in the first place). As Rosi Braidotti puts it,

the humanist image of thought...sets the frame for a self-congratulating relationship of Man to himself, which confirms the dominant subject as much in what he includes as his core characteristics as in what he excludes as 'other.' (Braidotti 67).

There is a self-perpetuating cycle of accreditation that begins when I assume (sometimes maliciously, sometimes out of ignorance) that x is valuable and important and ends when I conclude that y is less worthy because y lacks x.

At times, Ian felt himself swimming against a huge tide of disbelief. In a discussion of vegetarianism, the ways in which meat-eating is embedded as a normative practice in U.S. culture, and the ethical issues around humans determining what their pets eat, what is the humanities-trained social constructionist English professor to do when several high-performing students recite facts from their evolution class about the tooth structure of dogs that "prove" that dogs are designed to eat meat? Ian did not know how to respond, felt ill-equipped to respond, felt unable to speak to these students in the language of science that they are speaking, felt the teacher's credibility slipping away...

Meanwhile, Jan has been co-teaching an innovative series of courses with a colleague from economics. Called Humanomics, the program grew out of an extended discussion of the fundamental disconnect, and often distrust, between scholars in the humanities and economics. In fact, Jan was especially chosen for this job because of their expertise and experience as a scholar and teacher in English. At the core of Humanomics courses is the concurrent reading of literature and economic texts³; question-based, round table discussions; and team teaching. However, while it sounds quite balanced to be exploring markets and exchange and ethics

through economics and humanities texts, an unstated (or at least never explicitly stated) perception of economics as fact and literature as fiction (or some odd antonym for *facts*) permeates the classroom. And this binary construction of the dialoging texts is not neutral: “fact” is always seen as having the upper hand. Adam Smith and Frederick Hayek and Michael Polanyi and Thomas Sowell are taken seriously—obviously their ideas are to be valued—while Jane Austen and John Milton and Emile Zola and Mohsin Hamid are suspect, just novelists, after all. Even in a program with the intention of working across disciplinary barriers, the intention of challenging the idea that economics is bereft of humanity, there is an underlying bias toward facts that devalues the “structure of feeling” (to use Raymond Williams’ term) valued as an analytic tool in English studies. Here, too, the accounting, business, marketing, and economics majors are reluctant to abandon ideologies of scientific fact and objectivity; maybe no surprise there, but when the sociology and political science and English majors get caught up in this bias, the strength of the objectivity forces is clear. And while the students and professors discuss the need for better understanding prosperity and markets through a capacity for questioning and broadening our perspectives of the world, it seems the voices that dominate are those that sound authoritative, that talk facts, as if they are disembodied from human beings. So much is in play here, hundreds of years of scientism, of believing that reason rather than myth or the imagination or the senses or intuition or emotion is the foundation for all knowing (Craig Smith 234). And of believing that “reason” is transparent and universal, rather than itself a historical and cultural construct.

Working with a variety of majors in the Humanomics program, Jan has found that students—even those in the Humanities—talk about “facts” and “truth” as if they are inherent in the economics texts, allowing them to marginalize the literary texts they are reading at the same time. Jan has been struck by how this way of conceptualizing knowledge puts the locus of understanding outside the students themselves: “It’s there in the facts.” Students simply have to memorize these facts or call upon them in a paper and they will be knowledgeable, *right?* The possibility of ambiguity or of the worldview presented in literature as embodying knowledge or any kind of truth seems outside their epistemological frame. Some recent excerpts from student papers on Matt Ridley’s book on “how prosperity evolves,” *The Rational Optimist*, attest to facticity’s allure:

- “There is no doubt that progress does not reverse itself and moves us forward in a positive way. Ridley uses facts to show this is the case” (1 October 2014).
- “The view of the world through Wordsworth’s frame of reference is disheartening as he denigrates society for ‘getting and spending.’ However, the tension in Wordsworth’s poem is repudiated by the truth of reality, the progress in human economics” (30 September 2014).
- “These humanities texts are outdated, some being written in the early 1800s. Due to this fact, it is reasonable to argue that Ridley is indeed correct on what makes a better society. . . . If society wants to continue to improve and increase personal wealth, trade and consumerism is indeed the reasonable choice” (1 October 2014).

- “Ridley examines situations based on factual evidence and statistics. . . . He would find Steinbeck’s work probably meaningful, but insignificant in his quest to prove why one should be a rational optimist” (27 September 2015).
- “As so elegantly stated in Ridley’s well-reasoned and fact supported book, prosperity is a direct result of interdependence” (1 October 2014).
- “Ridley views the world scientifically, and uses number, graphs, percentages and other data to get his point across. Thoreau views the world through his eyes alone” (23 September 2014).

Jan and Jan’s colleague in the university’s Economic Science Institute have attempted to challenge this scientism. In their course, *Humanomics: Knowledge, Satire, and the Facts and Values of Economics*, they include a chapter from *A Culture of Fact: England, 1550-1720*, where Barbara Shapiro explores the role of “fact” in the early modern period in England. Shapiro’s work demonstrates that “the concept ‘fact’ itself has undergone considerable modification over time” (1). Taking shape in the legal field, “fact” was concerned with “human actions or events” (9). In the legal context, matters of fact did not refer to “established truth” but to an issue of truth, a determination of what might be known without direct observation. Some matters of fact could be proven false. In fact, there were references to “false fact” (64). From this initial understanding, “fact” was transformed “from something that had to be sufficiently proved by appropriate evidence to be considered worthy of belief to something for which appropriate verification had already taken place” (31). Over time, a culture of fact developed, one where the concept of “fact” was transferred to the natural world. “Fact,” which began as an epistemological

process, was transformed into an impermeable conclusion of science, of rationality, of empiricism, a term reserved for “certain knowledge” (77). This concept of fact was satirized by Swift as early as 1726:

As these noble *Houyhnhnms* are endowed by Nature with a general Disposition to all Virtues, and have no Conceptions or Ideas of what is evil in a rational Creature; so their grand Maxim is, to cultivate *Reason*, and to be wholly governed by it. Neither is *Reason* among them a Point Problematical as with us, where Men can argue with Plausibility on both Sides of a Question; but strikes you with immediate Conviction; as it must needs do where it is not mingled, obscured, or discoloured by Passion and Interest... because *Reason* taught us to affirm or deny only where we are certain; and beyond our Knowledge we cannot do either. (255)

Polanyi refers to the phenomenon Swift satirizes and that we have seen in our classes discussed here as “scientific detachment” (vii). He establishes the concept of *personal knowledge*, a way of knowing that “transcends the disjunction between subjective and objective” (300). The personal acknowledges requirements independent of itself (use of a word, for example) while acknowledging commitment of the self—realizing that “it is not the words that have meaning, but the speaker who means something by them” (252). This way of conceiving of knowledge is central to rhetorical studies and to the Humanities in general. Knowledge is personal, is created, is multiple and dynamic. Knowledge for many of our students is outside the self; knowledge is objective; and since they see science as “objective” and literature as “subjective,” they have

embraced scientism and positivism as their epistemological framework. There is no participation in the act of knowing in this epistemology; there is authority.

An attempt to challenge this dichotomy through Humanomics courses is a complicated task, as illustrated most obviously in the student papers excerpted above where the authority of the economic texts is reflected. Like Miles Corwin in his narrative of an economics professor who *caught* him reading a book during class, student work often reflects the assumption that the economic texts are where the knowledge resides. Even though they have an economics professor who values literature, students' reliance on the economic texts for support is paramount. The business/econ/science students have not yet, like Corwin's economics professor, "come to the conclusion that [their] education was narrow and incomplete," that "university officials who de-emphasized the humanities, and students who dismissed their significance, were misdirected" (Corwin 38).

The World of Fiction

We must interrogate the quantitative worldview by asking our students and colleagues "if we are incapable of integrating multiple ways of knowing" and "whether the products of scientific inquiry are the only guideposts to aid our progress" (Elaine Harding). J. M. Coetzee offers such an interrogation in his foundational, genre-bending, interdisciplinary, and self-reflexive animal studies text, the "novel" *The Lives of Animals*. The book offers an instructive allegory of the value of Jan and Ian's humanities knowledge and education, and of how we might productively use this knowledge and education to intervene into scientific and other discourses,

as urged by Braidotti in her meditation on the place of the (post)humanities in posthuman educational and social institutions.⁴ Coetzee's text ends with a terrible coming together of reason and emotion. John Bernard, a professor of physics and astronomy, is dropping his novelist mother off at the airport after her rather tumultuous visits to his campus, during which she speaks and debates passionately about the ethics of meat eating, amongst other animal-related topics. Elizabeth Costello, the novelist, is haunted—tormented—by the hideous lives and deaths of animals created and killed in the factory farming industries that produce meat for human consumption and by the humans around her, including her son and his wife, Norma, who explicitly or implicitly collude in the recurring Holocaust (Coetzee infamously compared the quotidian human slaughter of animals for food to the Nazi Holocaust). Costello says to her son,

“I look into your eyes, into Norma's, into the children's, and I see only kindness, human-kindness. Calm down, I tell myself, you are making a mountain out of a molehill. This is life. Everyone else comes to term with it, why can't you? *Why can't you?*”

She turns on him a tearful face. What does she want, he thinks? Does she want me to answer her question for her?

They are not yet on the expressway. He pulls the car over, switches off the engine, takes his mother in his arms. He inhales the smell of cold cream, of old flesh.

“There, there,” he whispers in her ear. “There, there. It will soon be over.” (69)

The “it” of the last sentence is ambiguous—the word could refer to Costello's visit with her son, her present agony, or her life, or any individual human life, or human suffering, or non-human

suffering, or life in general, amongst other possibilities. But in all cases, her son's response attempts to placate her with the promise of "its" temporary nature, completely skirting the actual subject of her pain and also not engaging her deep emotion. He doesn't speak of family, of love, of life, of animals. He doesn't speak of his feelings, of his feelings for his mother. The ambiguity of the "it" is symptomatic of his inability to engage his mother beyond the general and superficial. The reductiveness of John's response to his mother is glossed by the shorter sentences and phrases that ventriloquize his point of view: Elizabeth's opening sentences in this passage are quite lyrical and comprise multiple different kinds of phrases. John, on the other hand, is represented by staccato phrases, many in simple subject-verb-object form: "He pulls the car over, switches off the engine, takes his mother in his arms. He inhales the smell of cold cream."

John the scientist's inadequate response to his mother's pain, his refusal to engage it, could represent reason's inadequacy in the face of great emotion, reason's inability to capture the heterogeneity of consciousness and experience (recent critiques in composition studies of the over-attention to logos at the expense of pathos suggest that rhetoric has also not escaped reason's hold⁵), and the subterfuges, displacements, and violences that are performed under the sway of the ideology of reason. Indeed, during her debate with a philosopher at her son's college, Costello powerfully renounces reason "if reason is what sets me apart from the veal calf." Which brings us back to the argument about intelligence and humans at the top of the pyramid of animal life. In *What is Posthumanism?*, animal studies scholar Cary Wolfe points to the circularity of using the very criteria to privilege humans that should be under scrutiny in the first place: "our

shared embodiment, mortality, and finitude make us ... 'fellow creatures' in ways that subsume the more traditional markers of ethical consideration such as the capacity for reason, the ability to enter into contractual agreements or reciprocal behaviors, ... markers that have traditionally created an ethical divide between *Homo sapiens* and everything (or everyone) else" (62). The same could be said of the divide between the "scientific" and the "unscientific"—we cannot deploy as a yardstick to evaluate the relative merits of the two sides of the divide the very construction that was used to create the divide in the first place. And, indeed, as Cora Diamond points out, critics who read Coetzee's text only as an argument for animal rights and miss his presentation of Costello herself as haunted, as a wounded animal, fall prey to the very privileging of Cartesian logic that Costello (and the text) critique. The book *The Lives of Animals* includes Coetzee's Princeton University Tanner Lectures (Coetzee read his "novel" as the "Lectures," the latter called "The Lives of Animals") followed by "essays" by four prominent intellectuals responding to Coetzee's lectures. Some of the four struggle with how to respond to "lectures" in the form of a "novel," some simply address Elizabeth Costello's argument and ignore Coetzee's art, as if that art in itself weren't a type of argument, and as if that art in itself hasn't shaped the way we see and hear and respond to Costello and what she represents.

Pulling Back the Curtain

How are we (Jan and Ian, but also English faculty, humanities faculty, and all teachers) to respond when we are confronted with Costello's naysayers in our own classrooms?

Should we assert ever more forcefully the value of the humanities and humanities-based knowledge and ways of knowing the world? Should we study up in the sciences on the topics of our courses in order to meet our students on their own turf and embody the interdisciplinarity that we like to pay lip service to?

Coetzee's text suggests a different path. *The Lives of Animals* takes the form of fiction (a fiction that reenacts Coetzee's first presentation of the fiction as "lectures" at Princeton University)—this genre choice is itself a testament to the capacity of art to do what science may not be able to do. Perhaps Coetzee's decision to present lectures-in-fiction or fiction-as-lectures speaks to fiction's power and possibilities? It seems our most scientifically-minded students intuitively see or feel the power of art or the inadequacy of science to express, analyze, and respond to particular texts, ideas, emotions, and feelings barely articulable. How else to explain why some of the strongest of these students developed creative final projects (stories, photo series) in Ian's animal studies class when given free choice of genre and medium for the final project? Were they yearning for an alternate form of expression? Was this a way for them to express creativity and subjectivity in a socially- and academically-sanctioned way? Was it perhaps an unconscious acknowledgment of the impossibility of neutral, objective, or value-free inquiry? For the same students who chose to work on "creative" projects questioned and attacked class members who wrote essays, excoriating them as "too subjective" or "not subjective

enough”—almost as if the students who opted for creative projects did so to avoid the very policing of subjectivity that they subjected the essay writers to, secure in their knowledge that creative work was by definition subjective and thus believing it immune to this kind of scrutiny. And, of course, these students’ retreats from writing essays and their misguided assumptions about essays, also point toward the terrible ways in which English and other teachers have constructed the academic essay as objective, impersonal, and distant.⁶

Having students across the disciplines actually do creative work is certainly one way to invite them to experience effects and affects that other modes of production might not offer. But we also want to bridge the apparent disconnect between students’ intellectual positions and their unconscious understandings and embodied experiences. We want to bring the questions regarding ways of knowing to their attention, asking questions of their “facts,” creating opportunities for seeing multiple perspectives, for explicating various epistemological affiliations, and for students to learn to identify and analyze their own affiliations, and to recognize them as affiliations. But in doing so, do we run the risk of suggesting that these diverse value systems form a pluralistic free for all? How do we encourage our scientific students and colleagues to question their allegiances to “facts” without, at the same time, implying that their opponents need to take facticity seriously?

Perhaps these questions themselves could become discussion topics in class, rather than solely the basis of our behind-the-scenes hand wringing? By involving students in these debates, we would not only be inviting them into our scholarly community (see Graff) but also showing them how these questions are parts of larger conflicts around epistemology, knowledge,

scholarship, and teaching; questions that are not settled, that resist the comfort of facile right and wrong answers; but also questions that are an exciting and integral component of the critical thinking that should form the core of their education.⁷

Notes

¹ For a critical take on big data, see O’Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*.

² For a concise recent summary of these critiques, see Braidotti Chapter 1. In some of the now classic earlier scholarship, Sandra Harding, Donna Haraway, Vernon Rosario, and Trinh T. Minh-ha have pointed, in particular, to the gendered and racialized nature of science’s supposed universality and of people’s trust in science. In *Decolonizing Methodologies*, Linda Tuhiwai Smith argues that the privileging of reason and logic are peculiar to Western cultures, and that these values are hostile to many indigenous cultures. For a pointed exposé of the ways scientific discourses can use the mantel of “expertise” to occlude vacuity, see Montague’s “How to Win Any Argument: Pseudo-Scientific Neuro-Gibberish,” a worthy riposte to the Sokal scandal, the supposed exposé of cutting-edge scholars’ empty poststructuralist jargon that gripped academe in the 1990s when *Social Text* published a “nonsensical” article on quantum gravity.

³ The pairings include, for example, Steinbeck’s *The Grapes of Wrath* with Ridley’s *The Rational Optimist*, Swift’s *Gulliver’s Travels* and Polanyi’s *Personal Knowledge*, Stephenson’s *Snow Crash* and McCloskey’s *Bourgeois Dignity: Why Economics Can’t Explain the Modern World*, Zola’s *Germinal* and Hayek’s *The Constitution of Liberty*, Dostoevsky’s *The Brothers Karamazov* and Smith’s *Theory of Moral Sentiments*.

⁴ Other examples of such cross-disciplinary interventions that come to mind include the field of critical legal studies, where close readings of legal discourses was often undertaken by literary scholars crossing disciplinary boundaries; and the ways in which ACT UP and other AIDS

activists used rhetorical skills (both in their “reading” of official discourses and in their own representations of themselves, the AIDS crisis, and AIDS as a disease) and self-education to challenge the authority of scientific, medical, and governmental institutions in the US during the 1980s and 90s. In both cases, humanistic training, sensibility, and skills were used to critically interrogate and even reimagine non-humanities disciplines and discourses.

⁵ See, e.g., Worsham. For a recent discussion of emotion in the humanities and humanities scholarship more generally, see the *PMLA* special issue on emotion (130.5). The rise of Donald Trump is surely a powerful lay illustration of the dangers of underestimating the power of pathos, of assuming that voters would make logos-informed decisions, of the failure (on the part of pollsters, political commentators, and Hillary Clinton) to adequately account for the role of pathos in directing people’s imaginations and moving them to action.

⁶ For some classic and recent critiques of the ways in which the essay form is conventionally constructed in college composition classes, and of the privileging of this version of the essay in composition pedagogy, see Annas, Banks, Faris, Fort, Sirc, Weathers, Worsham. These critiques also connect to scholarship that is critical of the dominant Western-centered (and Aristotle-originating) construction of rhetorical history in the US (e.g., Baca, Powell).

⁷ We thank Holly Batty, Aneil Rallin, Morgan Read-Davidson, and Bart J. Wilson for suggesting ideas and resources that helped us shape this article. We are also grateful to the anonymous *College English Association Forum* reviewer for their feedback on an earlier version of this article.

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