Diffractive Possibilities: Cultural Studies and Quantification

Abstract

Cultural studies have not shared the widespread belief in quantitative methods. On one hand, the dominant orientation of quantitative social science research continues to hold on to positivist assumptions of objectivity and the privileged access to the “truths” of natural phenomena via the logics of mathematics. On other hand, cultural studies have maintained a hermeneutics of suspicion toward the methods of quantification. But, to what extent does this suspicion toward quantitative inquiry compromise the deconstructive project of cultural studies by falling into the trap of the quantitative/qualitative and, related, nature/culture binaries? Building on new materialist ideas, the author develops an ontological reconfiguring of measurement and statistics that is informed by Barad’s (2006) post-humanist performativity and diffractive method. The post-humanist deconstructive interventions on the nature/culture binary enable us to rethink the critical possibilities of quantification for the materialist analysis of power relations in cultural studies.

The number is no longer a universal concept measuring elements according to their emplacement in a given dimension, but has itself become a multiplicity that varies according to the dimensions considered. We do not have units (unités) of measure, only multiplicities or varieties of measurement. The notion of unity (unité) appears only when there is a power takeover in the multiplicity by the signifier or a corresponding subjectification proceeding.

–Gilles Deleuze & Felix Guattari, A Thousand Plateaus

In the opening quote, Deleuze and Guattari (1987) posit that the “number” can no longer be understood as a universal or abstract concept but rather must be reconceived as a multiplicity, a substantive entity that emerges from the enfolding of other elements, particles, or multiplicities. They imbue number with an ontology that is not a simple signifier representing the measureable social world, but one that possesses an ontology that is neither fixed nor reducible. Their reconceptualization of number as a multiplicity not only challenges the Modernist philosophical assumption of mathematics as an abstraction of natural phenomena, but also calls into question the paradigmatic assumptions of social science’s logical empiricism.

The 20th century was marked by two major paradigmatic shifts in social science research. The first was a shift to positivism and the associated quantitative imperative, and the second was the discursive turn that put objective knowledge and the accessibility of “truth” into question. While the latter questioned the epistemological possibilities of quantitative methods, the more recent paradigmatic shift toward relational ontologies and new materialisms opens up new possibilities for quantification, particularly for cultural studies and critical inquiry (Barad 2006; Kirby 2011). By engaging the work of new materialist feminisms, I seek to reconsider the relevance of quantification for critical social inquiry and cultural studies. I argue that the identity of the ontological and epistemological limits of quantification have constrained the possibilities for deconstruction and the materialist analysis of power relations. Inherent to any materialist analysis of power relations are, in part, questions of quantification. Thus, by building on new materialist ideas, I develop an ontological reconfiguring of measurement and statistics that is informed by Karen Barad’s (2006) post-humanist performativity and diffractive method. The diffractive method that I develop assumes that the quantitative is a special case of the ethnographic imagination and seeks to read the data of each method through each other method, with a particular focus on the discontinuities and disjunctures between the methods.
accord with Vicki Kirby (2011), I want to push the deconstructive boundaries of the cultural studies lens to consider the “unreasonable effectiveness” of quantitative methods. This is particularly important given cultural studies’ commitment to the materialist analysis and deconstruction of power relations, analyses that arguably necessitate the inquiries of quantification. At the same time, I want to destabilize the social scientific privileging of the multiplicities of numerical data, revealing the dangers of such a myopic lens of inquiry. The diffractive lens enables the critical possibility of quantification while addressing the ontological, epistemological, and methodological implications of post-humanist deconstructive interventions on nature and culture.

I begin this article by discussing the major paradigmatic shifts in the philosophy of science. These paradigmatic shifts are what lay the foundations for social science empiricism and the methodologies of quantification.

PARADIGMATIC SHIFTS: FROM POSITIVIST EMPIRICISM TO THE DISCURSIVE TURN

Social science empiricism has always been a subordinate heir to the natural sciences. Many of the paradigmatic assumptions, activities, and practices of the social sciences are some form of reappropriation of the natural sciences. As Thomas Kuhn (1962) put forward, a scientific paradigm constitutes a set of assumptions and activities that attain sufficient popularity so as to displace all potential alternatives. What is considered “normal science” is constituted in the theories, teaching acts, methodological training, and kinds of questions considered, as well as in the disciplining techniques that include scientific language and embodied practice. This is especially true in the performative acts of so-called scientific writing and speaking. Here, I would like to discuss what I see as the major paradigmatic shifts of the social sciences—positivist empiricism and the discursive turn—as a way to frame the backdrop of the more recent turn toward relational ontologies. Given the vast amount of work under both of these paradigms, I focus this discussion on some of the seminal thinkers and works that were associated with major shifts in scientific inquiry, beginning with Auguste Comte’s positivist philosophy.

The emergence of positivist philosophy in the early nineteenth century was one of the earliest forces that enabled and legitimated the scientific inquiry of metaphysical human phenomena. Particularly in the writings of Auguste Comte, positivist philosophy appropriated the scientific method to study the human mind and the social world. Comte believed that the scientific method could be appropriated and applied to study the mind and social life, and that it was necessary for the development of societies. Positivism was not only a radical idea but also paradigm shifting, as it had been widely held that the only thing that could be studied scientifically was the “natural” world. Major philosophers and social theorists from John Stuart Mill to Emile Durkheim took up this paradigm shift, thus facilitating the advent of social science disciplines such as economics, sociology, and psychology. Through the appropriation of the scientific method, the social sciences were built on the following tenets and assumptions of the natural sciences: (1) universals do exist for the human organism and the social world. (2) Universal truths can be established through the rational application of the scientific method. (3) Empirical observation is the only rational means of exhibiting the laws of the social world.

In addition to each of these tenets and assumptions, Comte (1988) privileged the mathematical sciences as the key analytic tool for achieving precision and certainty in the pursuit of “truth.” As Comte states, “mathematical science is of much less importance for the knowledge in which it consists… than for constituting the most powerful instrument that the human mind can employ in investigating the laws of natural phenomena” (66). As he went on to say, “It is, therefore, mathematical science that must constitute the true starting point of all rational scientific education, whether general or special” (67). It is from this logic that the quantitative imperative in the social and behavioral sciences was then created (Michell 1999). Thus, although mathematics and probability existed well before positivism (discussed further below) and were not always associated with the objective and rational reasoning of the scientific method, the call for quantification led to the later allied development of both measurement and statistics in the social sciences (Hacking 2006; Poovey 1998; Porter 1995). Quantification became an essential goal for the objective study of mental and social life. In the 20th century, the positivist tenets were incorporated into the logical positivist and later post-positivist movement in the philosophy of science. The scientific method and quantification became central features of the guiding paradigm in contemporary social and behavioral science. Under these terms, the
positivist paradigm became normal science, an almost taken-for-granted epistemological lens for knowledge production in the social sciences, with quantitative methods as its chief hallmark. Despite its widespread acceptance as the “normal science” of the social sciences, the epistemological assumptions of positivism were put into question in the 20th century. The emergence and influence of social constructionism and the discursive turn began to challenge the assumed objectivity and privileged accessibility of the “truths” of natural phenomena. Beginning with Ferdinand de Saussure’s (1910) linguistic structuralism and later Peter Berger and Thomas Luckman’s (1966) phenomenological social constructionism, the accessibility of the “real” was put into question. In de Saussure’s linguistic structuralism, we learn that language is a system of signs with governing rules. The referent to those signs (i.e., signified, meaning, or idea), we are told, has an arbitrary relationship with the sign. Meaning or signification emerges from a system of differences, such as the difference between day and night. Thus, the relationship between the sign and its referent is not natural; its relationship is merely the product of a social function. In contrast, Berger and Luckman (1966) teach us that it is through human perception and interactions with each other in social systems over time that people create concepts, mental representations, and meanings of the objects of “reality,” that which is said to be the object of scientific study. Thus, it is not that there exists no “real,” material world, but that the dilemma that Berger and Luckman pose to social science empiricism is an issue of accessing the “truth” or “reality” of the world. While I can discuss many other works associated with both of these lines of thought, I consider these two seminal works on two different perspectives of social constructionism and their epistemological implications for positivism.

Both of these perspectives influenced a raft of works in the social sciences but were clearly disparate in their approach. One hand, linguistic structuralism tells us that the subject is already socially determined by the social world; on other hand, the phenomenological social constructionism of Berger and Luckman teaches us that the object of “reality” is socially constructed. The binary between the signifier/signified and object/subject that was imposed by these two perspectives came under the deconstructive lens of Jacques Derrida (1967, 1972). The sign, Derrida states, is said to stand in place for the signified, the referent, or the thing it is said to presently represent. In language, the sign merely takes the place of the absence of presence of the referent. Thus, the sign is the deferred presence of the thing that is being signified, which can never be fully present. The absence of presence of meanings that are produced from difference is always deferred and differentiated. Moreover, difference is not naturally pre-scripted but is, in fact, an effect. Last, Derrida’s (1972) deconstruction of the full and total presence of the signified also puts into question the conscious, all knowing subject:

Most often, in the very form of meaning, in all its modifications, consciousness offers itself to thought only as self-presence, as the perception of self in presence. And what holds for consciousness holds here for so-called subjective existence in general. Just as the category of the subject cannot be, and never has been, thought without the reference to presence as *hupokeimenon* or as *ousia*, etc., so the subject as consciousness has never manifested itself except as self-presence. [1972:16]

Consciousness is merely a perception of presence and an effect of a myriad of absentively present forces. Not only are the identities of the limits of the signifier and signified put into question but also the analogous object and subject. Thus, both the object of reality and the perceiving subject are rendered partial and deferred, further putting into question epistemological possibilities.

In related work, Michel Foucault’s (1980) theory of discourse in the human sciences and the production of power and knowledge also substantially reconfigured the conception of knowledge. He postulated that a claim is believed when made by an authorized authority and circulated in society. The belief not only legitimates that knowledge as truth but also creates the conditions to act in accordance with that knowledge. Given that the claim is made by an authorized authority it generally will serve the interests of the structural relations of power. Thus, as society is acting accordingly they are also participating in the reproduction of power relations. In this way, the knowledge produced in the social sciences, including social statistics, becomes part of the enumeration of power.

Foucault’s interventions influenced a whole line of scholarship, particularly in the cultural history of quantification, including Ian Hacking, Theodore Porter, Mary Poovey, and Jonathan
Crary among others. The first work available in English that put Foucault’s archaeology to work was Hacking (2006). As a philosopher of science, Hacking examined the concept of probability and its emergence as a form of evidence. Tracing the concept prior to the Renaissance, he documents that probability was conceived of then as opinion:

Probability pertains to opinion, where there was no clear concept of evidence. Hence ‘probability’ had to mean something other than evidential support. It indicated approval or acceptability by intelligent people. Sensible people will approve something only if they have what we call good reason. [2006:22]

As defined by St. Thomas Aquinas, opinion, or opinio, referred to “belief which results from some reflection, argument, or disputation” (In Hacking 2006:22). It was during the Renaissance that a new understanding of evidence emerged. Renaissance thinkers such as Newton and Galileo proclaimed that natural phenomena were understood to be “signs” of the grand book of the universe and that mathematics was the language of those signs. Hacking explains:

A new kind of testimony was accepted: the testimony of nature which, like any authority, was to be read. Nature now could confer evidence, not, it seemed, in some new way but in the old way of reading and authority. ... Probability was communicated by what we should now call law-like regularities and frequencies. Thus the connection of probability, namely testimony, with stable law-like frequencies is a result of the way in which the new concept of internal evidence came into being. [2006:44]

Probability went from being constituted as opinion to becoming evidence as the measured reading of the signs of evidence. Here, sign referred to the signs of the natural world. The burden of proof for what constituted evidence shifted from an approval by “intelligent people” to the unquestioned author(ity) of “nature” (i.e., God).

Other work influenced by both Foucault and Hacking considered why “numbers” hold such discursive power in society and how statistics have become taken-for-granted forms of objective facts. Speaking to the faith in objectivity as a cornerstone to political democracy, Porter states that: quantitative estimates sometimes are given considerable weight even when nobody defends their validity with real conviction. The appeal of numbers is especially compelling to bureaucratic officials who lack the mandate of a popular election, or divine right. ... A decision made by the numbers ... has at least the appearance of being fair and impersonal. Scientific objectivity thus provides an answer to a moral demand for impartiality and fairness. Quantification is a way of making decisions without seeming to decide. Objectivity lends authority to officials who have very little of their own. [1995:8]

Where Porter argues that the discursive authority of numbers is in their assumed objectivity, Mary Poovey (1998) questions the value- and theory-free assumption of statistics, what she calls the “Modern fact.” Poovey delineates the historical distinction between positivist description and theoretical interpretation, particularly in the use of statistical evidence for governmentality. As a logic, rationality, and practice of the state, governmentality is a discursive field that manages and disciplines bodies, while rationalizing the exercising of power. Poovey traces the shifts toward numerical representation and objective knowledge to the mathematical practices of double-entry bookkeeping in Britain in the 16th century not as its beginning but as the inaugurating period and practices that could now be associated with modernity. Because of the reconceived value of numeracy as objective knowledge products of natural phenomena and the unquestioned nature of these signifiers, Poovey explains, these practices became appropriated by the State to legitimate practices of governmentality. More importantly, Poovey examines how the “Modern fact” was appropriated by the sciences of wealth and society (i.e., economics and the social sciences). With numbers as epistemological units, she argues, the social sciences came to rely on quantification because numbers could be understood in the following ways: as simple descriptors of the particulars of natural phenomena, as products of invariably governed rules of mathematics that provide a seeming resistance to bias, and imbued with an assumption of systematically produced knowledge due to the deductive tendencies of mathematics. Both Porter’s and Poovey’s projects interrogate the assumed epistemological objectivity of numbers and, as such, the social science imperatives and privileging of quantification.
Although not a project about statistics or quantitative methods, per se, Jonathan Crary’s (1990) *Techniques of the Observer* examined the historical backdrop and philosophical assumptions that undergirded vision, observation, and the body of the observer. He traces the various philosophical uses of the concept *camera obscura*, which “is part of a field of knowledge and practice that does not correspond structurally to the sites of the optical devices” (1990:8). While the focus of his project is on vision and the reconstitution of the observing subject, he also discusses the implications of limiting “observable proof” to only that which is visible.

What is important, then, is that these central components of nineteenth-century “realism,” of mass visual culture, *preceded* the invention of photography and *in no way required* photographic procedures or even the development of mass production techniques. Rather they are inextricably dependent on a new arrangement of knowledge about the body and the constitutive relation of that knowledge to social power. These apparatuses are the outcome of a complex remaking of the individual as observer into something calculable and regularizable and of human vision into something measurable and thus exchangeable. [italicized in the original] [1990:16–17]

Crary’s interventions on vision and the observing subject reposition the apparatuses of measurement and quantification as “visionary” instruments that enable the seeming objective observation of the world. Analogous to the aims of photography to represent the world it seeks to capture, the observing instruments of quantification were appropriated by the state for logics of representationalism as instruments of surveillance and the legitimation of power relations, and as a way of reconstituting the observer.

Although many more works have taken a critical orientation to positivist quantitative methods, the current work seeks to move beyond a hermeneutics of suspicion (Daston 1988; Dixon-Román and Gergen forthcoming; Gergen and Dixon-Román 2014; Steinmetz 2005; Walter and Anderson 2013; Wyly 2009). By leaning on new materialist interventions, in what ways might there be (re)new(ed) critical possibilities for quantification? How might the assumed objectivity and observing subject be reconceived? Can measurement be conceived beyond the logics of representationalism? How might “number” be reconstituted? And, how can we make sense of, what Kirby (2011) calls, the “unreasonable effectiveness” of mathematics?

### THE ONTOLOGICAL TURN: NATURE/CULTURE, OBJECT/SUBJECT, QUANTITATIVE/QUALITATIVE

Cultural studies … has mainly used qualitative research in order to avoid the pitfalls of sociological objectivity and functionalism and to give room to voices other than the theorist’s own. The problem of representativeness has been discounted. For cultural studies, knowledge based on statistical techniques belongs to the processes which “normalize” society and stand in opposition to cultural studies’ respect for the marginal subject.


Simon During’s criticisms resonate in critical social inquiry and cultural studies. The problems that arise from the normalization and representativeness of statistics are important issues to hold in tension. But to what extent does this hermeneutics of suspicion toward quantification compromise the deconstructive project of cultural studies by falling into the trap of another binary: quantitative/qualitative? In what ways does this binary assume an inextricable alignment between the quantitative and positivism? How might the assumptions of this binary rest on the pillars of the nature/culture binary? New materialists’ deconstructive interventions on nature and culture not only interrogate the pillars of theoretical frameworks of social and cultural theory, but they also put into question both positivist and postmodern arguments on the philosophy of science and the methods that have been falsely aligned with them.

On one hand, as discussed earlier, Comte’s positivist paradigm was grounded in the Modernist philosophical assumption that mathematical laws are what underlie natural world processes. These philosophical postulations gave way to what became known as the quantitative imperative. However, mathematician and cultural studies scholar Brian Rotman (2000) argues that the Platonic assumption that mathematical logic is the language of nature assumes a metaphysical deity. He instead postulates that mathematics is a semiotic system and human cultural invention and a
assumed an immutable nature with essential truth inquiry. Given that most critical theories have cally, to the knowledge production of criticalism (2006). In other words, nature does not pre-exist their involve-ment (2006). In other words, nature does not pre-exist their involve-ment of Earth's ontology. Entanglement suggests that perhaps the human inherited this cultural invention from nature rather than mathematics beginning with the human. In other words, as one of myriad ontological expressions of Earth's becoming, Kirby provocatively considers that perhaps the human is not the cultural inven-tor of mathematics but rather that the discursive practice of mathematics always already existed in nature. Thus, Plato's notion of mathematics pre-serves Derrida's aphorism to consider "there is no outside of nature." In this thesis, she makes two important arguments: (1) nature has always engaged in cultural processes of communicating, reading, meaning making, and decision making; and (2) the human organism is one of infinite expressions of Earth's ontology, what Kirby (2011) has called quantum anthropologies. Kirby pushes the humanities and social and natural sciences to rethink and re-question the inherited assumptions of the Cartesian split that has reinscribed binaries such as that between mind and body, and nature and culture. Quantum anthropologies is a new materialist theory of the entanglement of the world, of which we are not outside viewers, but rather always inside intra-acting observers of the world's in-process ontological fabric. As Barad defines, intra-acting (in contrast to interacting) refers to the relational acts within entangled entities, not between them. Kirby's lens of quantum anthropologies suggests that culture not only pre-dates the human organism but also that human inherited culture from nature as another entangled expression of Earth's ontology. Entanglement suggests inseparability and that the ontologies of the various expressions of Earth do not pre-exist their involve-ment (2006). In other words, nature does not pre-date culture but rather they are inseparable expressions of the same. Quantum anthropologies is a challenge, both ontologically and epistemologi-cally, to the knowledge production of critical inquiry. Given that most critical theories have assumed an immutable nature with essential truth that is veiled by culture, the implications of quantum anthropologies are profound. Not only are nature and culture entangled but so too are subject and object, and subjectivity and objectivity. The entanglements of quantum anthropologies push the project of deconstruction beyond the limits of social constructionism and postmodernism.

In pushing these boundaries, Kirby (2011) leans on Brian Rotman to consider the "unreasonable effectiveness" of mathematics. She argues that the Platonic imbuings of a theology, a deity, behind mathematics as the language of nature is undermined by the notion of math being a cultural invention. But, Kirby questions, what gives mathematics its "unreasonable effectiveness"? How do we make sense of the impressive functionality of advanced technologies that all have some mathematical algorithm(s) that inform their theoretical engineering and enable my digitalized writing of the words on the computer screen? Following Rotman, Kirby argues it is the power of perception as "empirically originated patterns, processes, and regularity." However, Kirby wants to consider that perhaps the human inherited this cultural invention from nature rather than mathematics in time and space. To state more clearly, During's (1993) criticisms of quantifica-tion as sociological objectivity and functionalism, which privileges qualitative methods for critical inquiry, rests on an assumption of the radical dif-ference between nature and culture. This is a rad-iical difference that assumes qualitative methods are for the inquiry of cultural processes and quantitative methods are for the inquiry of natural phenomena. The assumption overlooks and misrecognizes the quantum anthropological practices of mathematics at the cost of excluding the "unreasonable effectiveness" of quantitative inquiry from the deconstructive project of cultural studies and critical inquiry.

THE PERFORMATIVITY OF MEASUREMENT & STATISTICS
The numerical signifiers and methods of measure-ment and statistics are cultural inventions and
corporeal practices of the world. The semiotic perspective would suggest that it is via the systems of difference that meaning(s) and signification(s) are constructed and constructing. These in-process constructions can be understood as a product of what Louis Althusser (1971) referred to as interpellation. Interpellation is the ideological naming or hailing of bodies into social existence. When those ideologically named bodies recognize the call they simultaneously recognize and affirm ideology. For instance, a statistical mean has no social meaning until it is placed in contrast to another element by naming or labeling it as Black males. This labeling or naming also discursively forms the sign of the numerical estimate as the seemingly observed statistical mean of Black males, which then acts on others in mysterious and tricky ways by re-constructing their existing understanding of Black males, particularly when placed in contrast with other group means. Moreover, this statistical mean will further act on those human bodies that are socially constituted as Black males. Institutions will intra-act with them in particular ways and those who discursively self-identify as Black and male will also be appropriated by this statistical mean and reappropriate it from their own situated position. This discursive process of interpellation is part of what gender and queer theorist Judith Butler refers to as performativity. A performative is “that discursive practice that enacts or produces that which it names” (Butler 1993:13). Peformativity, for Butler, is not interested in the metaphysics of presence of ideology, meaning, and intention but rather focuses on that which is produced or enacted as a result of the speech act and its cultural history. As a performative, the cultural invention and practice of quantitative measurement and statistics are discursive practices that affect the respondent and the phenomena of interest while simultaneously enabling the conditions for their discursive response.

The Butlerian notion of performativity is helpful yet limited. Although Butler attempts to account for the historicity of nature she still makes the same postmodern assumption of an always already inaccessible nature due to the obscuring lens of culture (Barad 2006; Kirby 2011). More specifically, she does not account for the ways in which matter matters and the intra-acting processes that entangle nature and culture. Barad’s post-humanist reconceptualization of performativity accounts for the discursivity of both human and more-than-human ontologies. She writes:

This account refuses the representationalist fixation on words and things and the problematic of the nature of their relationship, advocating instead a relationality between specific material (re)configurings of the world through which boundaries, properties, and meanings are differentially enacted (i.e., discursive practices, in my posthumanist sense) and specific material phenomena (i.e., differentiating patterns of mattering). [italicized in the original] (Barad 2006:139)

This post-humanist reconceptualization of performativity accounts for the performativities of matter as well as the measuring apparatuses of the quantitative. For Barad, measuring apparatuses are specific material and discursive practices that have histories and ontologically (re)configure the world given their intra-actions with/in the world. Measuring apparatuses are boundary-making practices that produce, through their intra-active (re)configurings of the world, differences that matter. Apparatuses “are the material conditions of possibility and impossibility of mattering; they enact what matters and what is excluded from mattering” [italicized in the original] (Barad 2006:148). By determining what matters and what is excluded, the discursive practices of apparatuses create determinate boundaries and properties of “entities” within phenomena, what Barad refers to as agential cuts. As agential cuts, the produced boundaries and properties enact a “resolution” of an “entity” within phenomena of ontic and semantic indeterminacy. Thus, the researcher, the measuring apparatus(es), the sampled respondents, the produced and enacted numerical “estimates,” and the phenomena of interest are each ontological entanglements that are (re)configured via their intra-active performativities. The performative question(s) or task(s) of a measuring apparatus enact agential cuts that produce determinate boundaries and properties within a phenomenon of interest. As Barad argues, measurement is about the intelligibility of the world to itself, and the apparatuses of measurement constitute the material conditions of what is possible and impossible.

The enacted and produced numerical “estimates” of measuring apparatuses are material-discursive phenomena. As Barad describes, “phenomena are differential patterns of mattering . . . produced through complex agential intra-actions of multiple material-discursive practices or apparatuses of bodily production” [italicized in the...
As material-discursive phenomena, numbers, measurements, or quantitative data are a product of a myriad of forces; they are indeterminately ontic and semantic, produced and producing, intra-acting agencies. Thus, the question is not whether they “capture” or “validly estimate” that which they are purported to measure but rather, as an intra-acting agency, what might be some of the myriad forces that condition the production and enactment of these material-discursive phenomena? How might these intra-acting agencies enact, produce, or come to matter? This line of questioning moves away from representationalist concerns of meaning and validity toward that which is performatively enacted, produced, or comes to matter from the intra-acting agencies of the statistic.

In light of a post-humanist performativity of quantitative measurement and statistics, the example of the Black male statistical mean discussed above needs to be reconceived. The performative act of naming the statistical mean also has a history and does not occur independently. To estimate this measure of central tendency there had to be a research interest or query in knowing something about bodies that are discursively produced as Black and male. Thus, a measuring apparatus collected the data by performatively asking respondents about their racial identification and gender identification. Whether open- or closed-ended question responses, the question’s performative force is already situated in a historicity that enacts an agential cut of boundary-making categories of identity. As such, the measurement makes intelligible the material and discursive bodies who had been interpellated as Black and as male and enacted as a result of the performative act and event of measurement between the bodies of the researcher, the measuring apparatus, and the sampled respondents. Furthermore, the performative act and event measured three variables—race, gender, and the measured construct of interest—and while there is variation in the discursive enactment of these categories with/in the phenomenon, the estimated statistical mean re-enacts another performative by seemingly appearing to be singular when, in fact, it is a multiplicity. Again, myriad forces intra-act with the material-discursive practices of the measuring apparatus that produces material-discursive phenomena of statistical estimates.

Thinking about measurement from the lens of performativity provides some theoretical possibility to move beyond the logics of representationalism toward understanding how numerical multiplicities are produced, enacted, and brought into being. That is, if we think about the survey or measurement questions and their item responses as intra-acting performativities then this would make the practice of measurement an ontological entanglement with that which it seeks to observe. Understanding measurement from a lens of performativity would suggest that measurement is always already entangled with and part of the phenomena of inquiry. In other words, the positivist claims of “objective” measurement are put into question by the distributed agency of post-humanist performativity, pointing toward the intra-acting acts that seek intelligibility of phenomena of which the intra-actions are an entangled part. Furthermore, the iterative intra-acting process of measurement can then be understood to produce material-discursive phenomena that are measured traces and enfoldings of the phenomenon of interest.

These measured traces and enfoldings are what quantitative methods use to produce the numerical multiplicities of statistics. The performative production of statistics is always based, in part, on the relation and connection of concepts and ideas in timespace. For instance, the statistical mean of Black males discussed above produces a performative act and enunciation: “Black males had an average SAT score of 1000.” If another element (i.e., variable) were added then it would alter and complicate the performative act (e.g., “Black males in poverty performed, on average, 100 points lower on the SAT than Black males from median income families”). Even the ontology of the phenomenon of race would have temporal, spatial, and material implications on its measurement. For instance, there are Muslim Americans who prior to 9/11 did not find their bodies racialized; whereas, post 9/11 the shifted panoptic apparatuses of the State performatively produced their bodies as racialized. What is important to note is that (1) the material-discursive phenomena of statistics takes on a history and ontology and (2) it (en)acts on others while others simultaneously (em)act on it through their own situated interpretations and deployments/employments. Thus, the material-discursive phenomena of statistics produce descriptive information that comes to matter.

The numerical multiplicities of statistical estimation produce descriptive information and carry the hegemonic burden of being produced from a myriad of forces. Nonetheless, the multiplicities of the numerical estimates are not readily accessible.
Thus, rather than focusing on the meaning of the statistical estimates I argue for a focus on the produced differences via a diffractive reading/analysis.

DIFFRACTION AND A DIFFRACTIVE METHOD WITH QUANTITATIVE INQUIRY

Empiricism, and the quantitative in particular, have long been based on representationalist thinking and logics. Representationalism assumes that words, concepts, and ideas mirror that which they refer to. Critical scholars have long pushed for reflexive practices of social inquiry as a way to account for the researcher’s subjective influence on knowledge production by radically questioning one’s assumptions on the phenomena of inquiry. While reflexivity has been widely accepted in qualitative research, quantitative social science research has thus far lagged on these concerns because of the specters of the positivist claims to objectivity via the logic of mathematical reasoning. However, as deconstructed above, the assumption of the logic of mathematics as the language of natural phenomena is undermined by the Rotman and Kirby postulations of mathematics as a cultural invention with nonfixed prescriptions in time and space. Despite the stance of quantitative exceptionalism, practices of reflexivity have also been the focus of critical interrogation. As Barad argues in the above quote, reflexivity is like the optics of reflection. Reflexive practices seek to reflect on the representations of reality from a distance, maintaining the interest in and possibility for objectivity. Barad suggests that reflexivity simply mirrors the mirroring logic of representationalism; thus, an optics toward sameness and not difference. I want to move quantification away from such representationalist logics and beyond reflexive practices. Here, I lean on Barad’s notion of diffraction to develop a diffractive method with quantitative inquiry.

In contradistinction to the optics of homology, diffraction is interested in the produced differences that matter. Diffraction is an idea out of theoretical physics that refers to the way in which wave patterns overlap and how waves bend and spread when they encounter an interfering structure. The classic example Barad gives is when waves from the ocean encounter an obstruction of land with a gap or hole in it. The waves bend and spread as they pass through the gap. The obstruction of land with a gap is a diffraction apparatus and the wave pattern is diffracted. Thus, diffraction is not about the reflective search for sameness but the focus on differences that make a difference. In other words, diffraction focuses on the nature or effect of relational and connected differences.

A diffractive methodology, as articulated by Barad (2006), is a transdisciplinary approach of putting the theories of different disciplines in conversation. By thinking one disciplinary theory through another she seeks to pay particular attention to the boundary-making processes of each disciplinary theory and the ways in which one might rescue, recover, recuperate, or illuminate the other; making visible that which was excluded by the boundary-making practices of the disciplinary theory. My interest is to extend the diffractive methodology to have a particular focus on the methods of knowledge production. Like disciplinary theories, methods also entail boundary-making practices that produce overlapping yet different patterns of knowledge. For instance, quantitative methods produce knowledge about “how much” or “to what extent,” yet the multiplicity of particularities of “how” and “why” that produce the “how much” and “to what extent” are less readily accessible. Thus, it is for these reasons that I posit the importance of the use of multiple methods and a diffractive reading/analysis between/through each method. A diffractive reading through the methods is a research process which necessitates the employment of multiple and varied methods and con/text to diffractively read through multiple forms of data for social understanding.

A diffractive methodology is not mixed methods; rather, it is a research process of relational material and discursive ontologies. As Taguchi (2011) states, a diffractive analysis seeks to make matter intelligible in new ways and to imagine
other possible realities of the data. With its detailed attention to relational ontologies it critically accounts for what Mazzei (2013) refers to as the “movement of bodies” by analyzing the ways in which the various material and discursive bodies are intra-acting and becoming, and the ways in which my ontology, as researcher, is affected by my intra-action with the data. This allows for me as researcher to account for my process of knowing in becoming, what Barad (2006) calls onto-epistemology. As a research process of intra-acting ontologies it does not fall trap to the standardizing logic of a method.

My articulation of a diffractive methodology suggests the use of multiple and varied texts and methods to read the produced knowledges through one another with particular attention to their methodological boundaries and what is beyond; that is, no method or text is privileged over the other. Analogous to Jasbir Puar’s (2007) queer methodological philosophy, it is in the existing disjunctures and tensions between multiple and varied methods and texts that potentially rich intra-acting data can produce more enhanced and complex social understanding. Multiple texts might include quantitative data and ethnographic data, and data from sources like interviews, newspaper articles, legal documents, biographies and other written text, the Internet, documentaries, plays, or forms of film media. Multiple methods might consist of participant-observation ethnography, participatory-action research, visual ethnography, virtual ethnography, media ethnography, survey research methods, public opinion surveys, quantitative methods more broadly, literary criticism, narrative analysis, discourse analysis, and so forth. Each method and text has its strengths and limitations and, more importantly, produces different forms of knowledge through their boundary-making practices. Some methods and text are more amenable and advantageous to the study of particular phenomena but the diffractive reading of the data from each method through the other methods can allow to emerge that would have been missed otherwise, and can complicate social understanding of any particular phenomena.

In the diffractive analysis of data, the focus is less on the complementarities of methods (though important) and more on how one method goes beyond or contradicts another or how there may be disjunctures or tensions between varied sorts of data. We see this with the example of the Black male means discussed above. If these data were read through interview data what is likely to emerge are the more complicated and diffracted differences that illuminate the multiplicities of the estimate and that which comes to matter. These methodological and contextual interstices, I argue, are where the rich, complicated, and elusive forms of ontology and epistemology exist.

While quantitative methods are not a necessity for a diffractive methodology, this process provides a much richer possibility for the numerical multiplicities of statistics. Quantitative measurement and statistics have methodological utility and like other methods can substantially contribute to enhancing social understanding via the diffractive reading of their knowledge products through the data of other methods. With statistics understood from the lens of intra-acting performativities, they then become ontological forms of produced knowledge and the diffractive analysis of multiple and varied methods and text can broaden the analytic possibilities of critical inquiry. It is in the messy and slippery interstices of methods via the diffractive process that the impossible possibilities of quantification for critical social inquiry can be found. Although not necessary for a diffractive analysis, quantitative inquiry is critical for the materialist analysis of power relations in cultural studies. In our digital world, the diffraction of numerical multiplicities is ubiquitous.

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NOTE
1. Modern is capitalized here and throughout the paper to distinguish the philosophical paradigm from the use of modern as a period of time or history or an aesthetic that is a departure from tradition.

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