Critical Education

Diffracting Enfolding Futures
Critical Inquiry in Quantitative Educational Research

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Abstract

This article demonstrates an alternative ontological and epistemological approach to critical inquiry with quantitative methods. By building on new materialists thought, the critical possibilities of quantification are reconsidered via a diffractive methodology. By diffractively reading through multiple sources of data the article demonstrates how to critically analyze the multiplicity of "difference" in parenting practices. The diffracted results point toward the ways in which parenting practices are a result of myriad forces that cannot be reduced to pathology or deficiency but rather convey the inheritance of constraining and disenabling sociocultural and historical conditions. Concluding remarks suggests the quantitative turn for critical inquiry in educational research.

A paradigmatic rift remains between the work of cultural studies and critical inquiry and the dominant uses of quantitative studies in educational research that limit the critical and deconstructive analysis of power relations in educational research. The critical work of Bruno Latour and Pierre Bourdieu, as well as a slowly growing body of critical scholarship that employ quantitative methods (Dixon-Román, 2013, 2016; Walter & Anderson, 2013; Wyly, 2009), has dared to work within this contentious ontological and epistemological space. Even with this growing area of critical scholarship, there continues to be a radical divide. On the one hand, scholarship in cultural studies and critical inquiry in education has maintained a hermeneutics of suspicion toward the critical possibilities of quantitative methods at the cost of not accounting for what is inherently, in part, a question of quantification: the materialist analysis of power relations. On the other hand, the dominant orientation toward quantitative social science research in education has eschewed critical theories, maintained a neo-positivist posture toward the data, and assumed privileged access to the "truths" of natural phenomena via the logics of mathematics. As a result of an often atheoretical lens, the positivist orientation tends to interpretively misrecognize the underlying structural relations of the data, often falling into the trap of pathology, deficiency, and depravity narratives of the marginalized. From a Western cultural perspective of individualism where social problems are understood to inhere within persons or groups, the ideological interpretive misrecognition of the marginalized as morally wanting, socially deficient, or intellectually inferior is 'common sense.' This is especially the case when the measured unit of analysis is often individuals or families and the comparative lens of statistics necessitates the interpellation of identity and difference. Educational research needs an alternative approach to critical inquiry in order to push the field radically forward toward new forms of materialist analysis of structural relations of power and inequality in education.

In this article, I demonstrate an alternative ontological and epistemological approach to critical inquiry in education with quantitative methods. By building on the work of new materialisms (Barad, 2006; Coole & Frost, 2010; Kirby, 2011), I reconsider the possibilities of quantification via a diffractive methodology. A diffractive methodology, as articulated by Barad (2006), is a transdisciplinary approach of reading the theoretical limits of different disciplines through one another in order to consider how the tensions between them might productively lead us toward new theoretical possibilities. Per previous work (Dixon-Román, 2016), I extend this method to include the reading and analysis of data from multiple methods. Doing a diffractive analysis of multiple forms of data opens up new possibilities for analyzing social reproduction in education.   As a phenomenon that has been substantially examined in social reproduction studies in education, I focus the analysis of this study on the multiplicity of "difference" in parenting practices. Although the influence of parental involvement on achievement outcomes has recently been challenged (Robinson and Harris, 2014), parenting enrichment practices have consistently been found to be associated with child development (Duncan and Brooks-Gunn, 1997) and academic achievement (Dixon-Román, 2013; Duncan and Brooks-Gunn, 1997; Phillips et al., 1998). In fact, parenting practices have also been found to be strongly associated with race and/or family socioeconomic background (Dixon-Román, 2013; Duncan and Brooks-Gunn, 1997; Lareau, 2003; Robinson and Harris, 2014; Phillips et al., 1998). Despite these findings, research on parenting practices has been a contentious area of work given that the analysis of race and class differences in parenting practices easily slips into narratives of pathology and deficiency. In other words, it becomes how we can make the practices of parents of color and poverty more like those of white middle-class heteronormative parents. In order to not fall into these ideological traps, I analyze the multiplicity of "difference" (e.g., race, gender,

class, & sexuality) in parenting practices from the lens of assemblage. Assemblage is a system made up of the organization, arrangement, relations, and connections of actualities, objects, or organisms that are a sticky constellation of a multiplicity of forces producing an event, situation, or composite grouping or body (Deleuze & Guattari, [1980] 1987). In accordance with Puar (2012), I seek to analyze the multiplicity of "difference" as an assemblage in the practices of parenting. I posit practices of parenting as a performativity in order to conceptualize the processes of social reproduction. A performativity is a "discursive practice that enacts or produces that which it names" (Butler, 1993, p. 13). Here, I lean on Barad's (2006) post-humanist theory of performativity in order to account for the inseparable material and discursive ontologies enacting practices of parenting. For Barad, materiality is discursive and discursive practices are always already material. Therefore, I examine the ways in which parenting performativity is a result of the entanglement of material and discursive forces and the extent to which assemblages of "difference" are socially reproduced in the educative processes of parenting and why. As will be illuminated by the diffractive analysis, "difference" is not the issue, it is the materially constrained possibilities and ideological assumptions made about "difference" that matter for reproducing power relations in the pedagogical forces of parenting.

In order to demonstrate a diffractive analysis of "difference" in parenting practices, I examine the following research questions: To what extent are differences in parenting practices contingent on the child's race and gender? To what extent are parenting practices associated with parental expressed responses to gender roles and norms in parenting? How much do the parents' and grandparents' socioeconomic resources account for the variability in parenting practices? And, how might child sexual identification (re)configure parental intra-actions and practices with their child? By employing data from the Panel Study of Income Dynamics, Anne Lamott's (1993) *Operating Instructions*, Common's (2011) *One Day It'll All Make Sense*, and a viral YouTube video, I situate the multiple forms of data in the historicity of the assemblages of structural relations of "difference" and understand the material and discursive practices of parenting as boundary-making practices. I diffractively read through the data demonstrating how parenting practices are a result of myriad forces that cannot be reduced to pathology or deficiency but rather convey the inheritance of constraining, disenabling, and even violent sociocultural and historical conditions. I conclude by providing remarks regarding the enfolding futures of the quantitative turn for the critical analysis of power relations in educational research.

New Materialisms and Diffraction

A return to relational ontologies has emerged in social inquiry. Much of this work comes back to a foundational, taken-for-granted division between nature and culture, what also informs the oppositions between matter and meaning, the body and ideality, and signifier and signified, among other dualisms.

While the radical division between nature and culture goes back to early philosophical thinkers such as Descartes and his idea of the cogito, the social sciences inherited these Modernist assumptions in Comte's philosophical and political project of positivism. The "social physics" that Comte developed was situated on not just the Cartesian split between nature and culture but also a definition of matter as "corporeal substance constituted of length, breadth, and thickness; as extended, uniform, and inert" (Coole and Frost, 2010). It was this definition of

matter that became constitutive of the natural world and the basis for how matter became conceived for both the natural and social sciences.

The positivist inherited conception of matter and assumed nature/culture binary was challenged in the twentieth century by the discursive turn in the sociology of science and postmodern philosophy. Deconstruction and post-structuralism, in particular, interrogated the binary between nature and culture, moving in promising directions that put into question matter, the body, truth, the metanarratives and models of science, and the instrumentation and interpretation of the products of science. Thinkers such as Jacques Derrida posited that "there is no outside of the text." This postulation extends the reading, scripting, and meaning making of culture beyond the written text to have no limits (Kirby, 2011), making the objects of nature signifiers whose reading and interpretation are always obscured by culture. This powerful theoretical move reconfigured the ontology of culture and the epistemological possibilities of nature rendering the objects of science unintelligible, incomprehensible, and incalculable.

While the deconstructive workings of these aphorisms put into question the foundations of both science and the nature/culture binary, they still preserved the separate identities of the two. They ultimately did not interrogate the identity and ontology of nature. In order to push the envelope in considering the ways in which the categories of nature and culture are entangled, new materialists such as Vicki Kirby have raised the following provocative question: "To what extent is nature culture and culture nature?" More specifically, Kirby reappropriates 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. This is not an understanding of Earth as a passive and fixed substance but rather as a vibrant, dynamic, and evolving being. Both of these arguments reconfigure the ontological and epistemological entanglements of nature and culture, pushing the limits of the cultural fabric of life while reconsidering the powerful language of science and technology.

New materialist feminists have taken seriously the remarkable developments in the natural and physical sciences in order to consider the entanglement between nature and culture and the ontological reconceiving of matter. Work in complexity science and biosemiotics, for instance, has demonstrated the ways in which on the cellular level there is a process of reading and discerning that takes place, a process of decision making, and how in which the decision to open up to the wrong cell may result in its death (Hoffmeyer, 2008; Swimme and Tucker, 2011). Similarly, although we theoretically know little about the existence of particles, it is agreed that the short-lived and fluctuating existence of particles must be accounted for in any conception of matter. Particles are "like vibrant strands of energy, strings that oscillate in eleven dimensions" (Coole and Frost, 2010, p. 12) in and out of existence. The understood ontology of the particles of matter as fluctuating and short-lived energy underscores the porous, non-stable ontology of matter. New materialists have taken these developments seriously, moving away from conceptions of matter as an inert substance that is subject to the forces of predictable causal processes. For new materialists, matter is active, vibrant, creative, productive, and unpredictable (Coole and Frost, 2010).

The new materialists deconstruction of nature and culture has profound implications for social inquiry and the ontological assumptions of the researcher and social phenomena. As

researchers, new materialists understand our existence as deeply part of and becoming with the phenomena of inquiry. In order to move away from the representationalist assumption that concepts mirror that which they refer to, I lean on Barad's notion of diffraction in order to develop a diffractive method with quantitative inquiry. 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. As articulated by Barad, diffraction 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. Thus, diffraction is not about the reflective search for sameness but focused on differences that make a difference. Here, I 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 further discussion on this extended approach to diffractive methodology see Dixon-Román, 2016)

A diffractive methodology is not mixed-methods; rather, it is a research process that accounts for relational material and discursive ontologies. As Taguchi (2012) states, a diffractive analysis seeks to make matter intelligible in new ways. And, with its detailed attention to relational ontologies it critically accounts for 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 (Mazzei, 2013). This allows for me as researcher to account for my process of knowing in being (Barad, 2006). My articulation of a diffractive methodology suggests the use of multiple and varied text and methods in order to read the produced knowledges through one another with particular attention to their methodological boundaries and what's beyond; that is, no method or text is privileged over the other. The diffractive methodology enables new possibilities for the quantitative analysis of assemblages of "difference" in parenting practices.

Assemblages and the Quantitative Inquiry of Re(con)figuring Structural Relations

Inherently, social reproduction is about reconfiguring assemblages of "difference." Assemblage is a system made up of the organization, arrangement, relations, and connections of actualities, objects, or organisms that are a sticky constellation of a multiplicity of forces producing an event, situation, or composite grouping or body (Deleuze & Guattari, [1980] 1987). Assemblages acknowledge the ontologies of the more-than-human bodies that intra-act within and with/out the human body. Moreover, assemblages understand social categories such as race, gender, and class as situated in events, acts, and situations rather than characteristics of human subjects (Puar, 2012). Thus, as a theory that critiques both structural relations of "difference" and identity politics and accounts for more-than-human ontologies, it is not just post-race (Leonardo, 2013), it is also post-humanist. Here, I want to consider how a lens of assemblage might have critical promise for approaching the quantitative analysis of "difference" in social reproduction studies.

While much of the quantitative work on social reproduction has either been a-theoretical or situated in Modernist social theory, it has not adequately accounted for the multiplicity of "difference." For any analysis of reproducing power relations, it is necessary to account for the intra-activity of both more-than-human and human, nature and culture, and material and sociocultural forces. These often overlooked more-than-human performatives are often critical features to the (re)configuring of power relations. For instance, the 1973 legalization of the female right to surgically remove the matter of the fetus and placenta from the womb (re)configured gendered structural relations in material conditions and ideological control of the body including the legal constitution of the fetal organism as a separate being. Thus, any analysis that does not account for more-than-human, "natural," or material intra-acting ontologies is missing important dynamics to the (re)configuring of power relations.

In each generation of shifting historicities, there are material and sociocultural re(con)figurings of structures such as race, gender, and class (among others that are part of the (re)configuring entanglements of space, time, and matter. In other words, race, gender, and class are more-than-human interpellations and are part of the more-than-human ontologies of material resources and conditions entangled with the discursive formations and limits of lived experiences. This implies that their historicities are complex, shifting, differentiating, and multiplicative. In any given social situation, we cannot think of their assemblage as a simple additive contribution but rather as a non-fixed convergence and operation of each one working through the other.

This is also the case over the lifecourse and through the (re)configurings from one generation to the next. This sense of structural relations as complex, differentiated, and working through one another--as assemblages--creates space for the particularities of, for instance, a parent's own childhood to show up in their practices of parenting despite the parent's adult material and sociocultural resources and conditions. In other words, the structural relations of the grandparents when the parents were growing up may produce markings of the structural relations in the parenting practices of the parents (in)dependent of the parents' adult structural conditions. Thus, like institutions (Mare, 2011), the assemblages of (re)configuring structural relations outlive people too.

Assemblages of reconfiguring structural relations are critical for the quantitative analysis of "difference" in social reproduction studies. They provide a lens that moves away from the essentialism of identity politics by understanding the multiple categories of "difference" as situated in the intra-acting performativities of the events and situations of the measurement encounter. Assemblage situates the emergence of statistical estimates as a product of a myriad of forces including the assemblages of "difference." Theoretically, assemblage also includes the more-than-human intra-acting ontologies among the myriad of forces. Thus, statistical estimates of "difference" are materially and discursively produced and producing, and need to be more critically interpreted as intra-actively enacted from the relations and connections of the sociocultural and historical conditions of the structural relations of measurement. The current article seeks to quantitatively examine the multigenerational materiality of the assemblages of parenting performativities.

Assemblages of Parenting Performativities

As alluded to in the previous section, parenting practices are material and discursive practices. They are embodiments that are situated in time and space and mediums for reconfiguring structural relations. The structural relations that materialize in performativities of parenting are most readily understood from the lens of assemblages. Here, I will use the example of gender performativities in parenting for pedagogical simplicity, though I assume these gendered parenting performativities to be converging and operating through the structural relations of race, class, sexuality, and dis/ability among other social categories of "difference."

With her theory of gender performativity, Judith Butler (1990) interrogates the cultural belief of "natural genders" and their assumed inherent ties to sexuality. According to Butler, gender is not an internal organizing principle of the body that causes individuals to have particular characteristics and act in particular ways in line with their anatomical sex. Rather, gender identity is "a personal/cultural history of received meanings subject to a set of imitative practices which refer laterally to other imitations and which, jointly, construct the illusion of a primary and interior gendered self" (Butler, 1990, 138). Over time, the "sedimentation" of gender norms for an individual and for society as a whole has produced a belief in dichotomous "natural sexes." The performance of gender has become mundane to life to such an extent that what are actually stylized repetitions of acts seem inborn and uneventful. It is the mundane nature that gendered acts have taken on that creates the illusion of their fixed, "innate" presence. For Butler, a performative is a "discursive practice that enacts or produces that which it names" (Butler 1993, p. 13). Performativity 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. While Butler's (1993) theory of performativity is helpful for thinking about social reproduction in parenting practices her conception of matter as that which is enacted only from the materialization of discursive acts is limited. Acknowledging the theoretical utility of Butler's performativity, Karen Barad (2007) diffractively reads Butler's theory through Neil Bohr's quantum physics conception of matter in order to develop her post-humanist theory of performativity, accounting for an always-already *mattering* matter. For Barad, materiality is discursive and discursive practices are always already material. Matter is not assumed to be a fixed, immutable corporeal substance but rather a substance that has mutable, intellective, and communicative ontologies. Thus, the sedimentation of gender performativity is a result of the entanglement of material and discursive intra-actions.

The performativity of gender materializes in parents' beliefs and ideas of parenting and gendered roles in parenting as well as practices. Parents both reproduce and re-socialize beliefs about what males can and should do and what females can and should do. This includes who can and should be the breadwinner and who can and should be the nurturer. These beliefs are also already materialized in the everyday practices that parents engage in with their child. Depending on the parents' gender ideologies, these already materialized everyday parenting practices may also be gendered. Parents' practices in intra-action with their children--the cultural knowledge, sensibilities, and practices transmitted by the family as well as the social relationships and networks—are often boundary-making practices that enact differently for their sons than for their daughters.

As I mentioned above, parenting performativities are not simply or even neatly gendered. Parenting performativities are assemblages of structural relations of "difference" such as race, gender, class, sexuality, and dis/ability. Assemblage accounts for the ways in which the gendered parenting performativities are both complicated and queered by the explicit and implicit social categories and experiences of social situations. And, it is my contention that in order to study the assemblages of performative processes it is necessary to diffractively read and analyze through the data of multiple sources and methods.

Methods

Sample and Data

This study seeks to diffractively read and analyze through four forms of data: the Child Development Supplement (CDS) to the Panel Study of Income Dynamics (PSID) (Hill, 1991), Ann Lammott's *Operating Instructions*, Common's *One Day It'll All Make Sense*, and a YouTube video that went viral, "How not to react when your child tells you that he's gay" (https://www.youtube.com/watch?v=1df_i26wh-w).

Given my interest in social reproduction and parenting, I chose to analyze data that provide an intergenerational or multigenerational structure. The PSID is a nationally representative longitudinal data set containing information on family economics, education, and composition about families and all individuals in those families collected every year through interviews since 1968 and every other year starting in 1999. The CDS collected behavioral, psychological, and achievement data from 2,394 families of the PSID with 3,563 children aged twelve and under in 1997 (Mainieri, 2005). In this study, in order to be included in the sample one either had to be a member of one of the original 1968 PSID families or marry into one of these families. The grandparent was the (biological or adoptive) parent of the (biological or adoptive) parent that was a participant in the PSID. Approximately half of the grandparents were paternal grandparents ($N = 1138$, 47 percent). Because the sample sizes of other racial/ethnic groups are relatively small, black ($N = 1047$) and white ($N = 1192$) children were the two groups of focus. Of the black children 48 percent were females and of the white children 50 percent were females. The longitudinal family economic and child development data makes the PSID one of the richest datasets to study intergenerational and multigenerational processes of social reproduction. For further details on the operationalization of the analysis variables from the PSID, please see the appendix.

I also chose memoirs and visual media that had some degree of intergenerational or multigenerational structure in the narrative. Anne Lamott's *Operating Instructions* is a memoir about latter stage pregnancy and her parental experience during her son's first year of life. In Common's memoir *One Day It'll All Make Sense*, his mother provides commentary throughout. I also employ a YouTube video of a Southern gay male youth coming out to his family. This is a video that went viral and provides a glimpse into the act and event of coming out for a Southern gay male youth. Each source of data depicts different variations of intergenerational or multigenerational social processes and assemblages of parenting practices. As a diffractive analysis, the source of the data matters less than the boundary-making processes of each method and the ways in which one might illuminate the other by making visible that which was excluded by the boundary-making practices of the other. While there are many sources of data to choose

from, I selected data that would have the greatest potential of illuminating one another on parenting performativity.

Analysis: A Diffractive Analysis

Given the focus on difference rather than sameness (e.g., reflexive practices), diffractive analyses are particularly interested in the produced tensions and differences in the data in order for the multiplicities of the phenomena to emerge. This is particularly relevant for the analysis of the assemblages of "difference" in parenting practices so as to explore heterogeneity and not fall into the trap of narratives of pathology, deficiency, or depravity. Here, I employ the analysis of structural equation models of parenting practices, a close reading of two memoirs, and an analysis of a source of online visual media. I read each source of data through the other so as to both illuminate the boundary-making practices of each and highlight the produced differences that *matter*. Finally, I discuss the ways in which the produced data on assemblages of "difference" in parenting performativities affects me so as to account for my knowing-in-being.

Diffractive Analysis of the Assemblages of "Difference" in Parenting Performativities

Descriptive and Exploratory Analyses of the CDS Sample

In order to characterize the PSID-CDS sample I present a series of descriptive statistics. The average age of the grandparents was 48 in 1984, ranging from 16 to 82, and the average age of the parents was 34 in 1997, ranging from 14 to 75. Thus, on average, the parents were 12 to 26 years of age between 1975 and 1989, the year range of the grandparent data. Of the 2,563 children, the average age in 1997 was 7.5 and in 2002 was 11; there were 1,314 males (51.27%) and 1,249 females (48.73%); and 1,220 black children (47.6%) and 1,343 white children (52.4%). Of the black children 47.9% were females and of the white children 49.5% were females. Table 1 indicates that the sample of black families earned substantially less, were less affluent, had lower levels of education and occupational prestige, and were less likely to be married for both generations. These estimates all corroborate with other national estimates.

Assemblages of Race, Gender & Class

In the *New York Times* best seller *Operating Instructions*, Ann Lamott (1993) candidly shares her thoughts, feelings, and experiences, as a first-time single parent, of late pregnancy and her son's first year. Among the many experiences she talks about, Lamott describes in detail what it was like when she learned her son's sex. Two weeks after the ultrasound, she received a call from the nurse about her amniocentesis test. The nurse "talked about the findings for a while, although I did not hear a word, and then she said, 'Do you want to know its sex?' And I said yes I did. . . . It is a boy" (p. 7). The gender interpellation by the technoscientific medical apparatus is one of the classic examples that Judith Butler, Karen Barad, and others have pointed to as that which initiates the iterative process of becoming gendered. And, it is the iterability of gender interpellations that produces the sedimented embodiment of gender performativity that is seemingly naturalized and taken for granted. The performative acts of this medical apparatus do not just constitute the gender of the fetus but also, via the amniocentesis test, the "normally-abled" fetus as well as the assemblage of cultural and historical forces from the economic and racialized dynamics of ultrasound technology and practices (Barad, 2007). Importantly, this performative

Table 1. Descriptive Statistics of PSID-CDS Analysis Variables

	Total Sample					White Sample		Black Sample	
	mean	SD	Min	Max	% Missing	mean	SD	mean	SD
Child Age 1997	7.5	2.9	3.0	13.0	26.50%	7.4	2.9	7.5	2.9
Parent Age 1997	33.9	7.8	14.0	75.0	0.00%	34.5	7.0	33.3	8.6
Parent Married 1997	63%				0.08%	83%		41%	
P Head Education	10.9	2.3	0.0	15.0	4.00%	10.0	2.4	10.0	1.9
P Head Occupation	42.7	13.3	20.8	86.1	18.30%	46.5	14.0	37.9	10.6
P Permanent Income	$38,489	$45,254	$1,105	$780,976	0.00%	$52,489	$53,560	$23,075	$23,624
P Stocks/Mutual Funds	$0	$111,536	$0	$4,331,984	0.04%	$0	$153,019	$0	$7,550
GP Married 1984	68%				17.60%	85%		49%	
GP Age	47.6	11.0	16.0	82.0	17.80%	49.0	9.7	46.0	11.9
GP Head Education	11.0	3.3	0.0	17.0	17.90%	12.0	2.9	10.0	2.9
GP Head Occupation	34.5	10.8	16.8	73.5	41.10%	35.0	11.6	34.0	10.4
GP Permanent Income	$39,627	$29,264	$3,862	$309,705	11.10%	$52,954	$31,326	$26,914	$16,484
GP Stocks/Mutual Funds	$0	$22,291	$0	$400,000	27.40%	$0	$28,011	$0	$14,029
Cognitive Stimulation & Emotional Warmth	19.22	3.62	7.0	27.0	0.00%	20.3	3.4	18.0	3.5
Cultural Practices	0.0	0.6	-1.9	2.0	0.04%	0.2	0.6	0.0	0.6
Social Relationship Practices	0.0	0.9	-2.9	3.0	0.04%	0.3	0.8	0.0	0.9
Parental Embodied Expressed Response to Questions on:									
Affect Toward Parenting	0.0	0.4	-1.6	0.7	0.04%	0.0	0.3	0.0	0.4
Gender Roles	0.1	0.6	-2.6	2.0	0.04%	0.1	0.6	0.0	0.6
Parental Gender Egalitarianism	-0.1	1.0	-4.4	2.8	0.04%	-0.2	1.1	0.0	0.8
Maternal Employment & Childcare	0.0	0.3	-1.2	1.2	0.04%	0.0	0.3	0.0	0.4
Paternal Involvement	0.4	0.6	-2.0	2.4	0.04%	0.6	0.5	0.1	0.5
Total N	2563					1343		1220	

Note: P represents parents and GP represents grandparents.

Table 2. Fits Indices for Structural Equation Models.

Models	df	scf	chi-square	cd	TRd	RMSEA	CFI	TLI
CFA of Parenting Practices	218		987			0.03	0.91	0.94
CFA of Parenting Practices and Gender Ideology	1132		5194			0.037	0.93	0.92
Fully Constrained CFA	5352	0.93	13405			0.048	0.87	0.88
Parenting Practices by Gender *	5349	0.93	13201	6.28	36.54	0.048	0.88	0.88
Parenting Practices by Race & Gender *	5346	0.92	12947	4.49	58.13	0.047	0.88	0.88
Parental Gender Ideology by Gender *	5338	0.92	12759	2.92	72.21	0.047	0.88	0.88
Parental Gender Ideology by Race & Gender *	5514	0.91	13524	0.61	-936.15	0.048	0.88	0.88
Parental Gender Ideologies as Covariates	5499	0.87	13289			0.047	0.88	0.88
Dispositions toward Parenting as Covariate	5508	0.88	13238			0.047	0.88	0.88
Parent Socioeconomic Position as Covariate	6524	0.90	14052			0.042	0.88	0.88
Grandparent Socioeconomic Position as Covariate	7895	0.91	15356			0.042	0.86	0.86
Parental Gender Ideology Effects by Race*	7841	0.88	15173	5.85	116.63	0.042	0.86	0.86

* 95% Confidence interval does not include 0.
Note: scf is the scaled correction factor; cd are weighted least squares adjusted degrees of freedom; TRd are weighted least squares adjusted chi-square RMSEA is the root mean square error of approximation; CFI is the comparative fit index; and, the TLI is the Tucker-Lewis Index.

Table 3. Unstandardized Estimates (with standard errors) of Structural Equation Model.

	Cultural Practice	Social Relationships	Emot & Cog Stimulation	Parenting Affect	Gender Roles	Gender Egalitarian	Maternal Emp & Childcare	Paternal Involve
Affect Toward Parenting	0.077 (0.060)	0.012 (0.094)	0.831 (0.198)*	--	--	--	--	--
Gender Roles	0.120 (0.077)	0.313 (0.139)*	0.350 (0.258)	0.227 (0.053)*	--	--	--	--
Parental Gender Egalitarianism	-0.090 (0.053)	-0.247 (0.100)*	-0.084 (0.166)	-0.133 (0.038)*	--	--	--	--
Maternal Employment & Childcare	0.113 (0.080)	0.335 (0.151)*	0.271 (0.246)	0.044 (0.049)	--	--	--	--
Paternal Involvement	0.044 (0.039)	0.035 (0.059)	0.034 (0.126)	0.124 (0.031)*	--	--	--	--
Child Age 1997	-0.100 (0.009)*	-0.033 (0.015)*	0.502 (0.020)*	-0.002 (0.005)	-0.005 (0.008)	-0.020 (0.012)	-0.004 (0.002)	-0.011 (0.012)
Parent Age 1997	0.002 (0.003)	-0.008 (0.007)	0.021 (0.011)	-0.004 (0.003)	-0.011 (0.005)*	-0.017 (0.007)*	-0.001 (0.002)	-0.011 (0.006)
Parent Married 1997	-0.006 (0.053)	0.212 (0.102)*	1.206 (0.161)*	0.096 (0.040)*	-0.271 (0.075)*	-0.393 (0.112)*	-0.012 (0.020)	-0.097 (0.097)
P Head Education	0.000 (0.011)	0.056 (0.021)*	0.134 (0.033)*	0.010 (0.008)	0.040 (0.014)*	0.035 (0.020)	0.000 (0.004)	0.080 (0.025)*
P Head Occupation	0.001 (0.002)	0.005 (0.003)	0.014 (0.006)*	0.001 (0.001)	-0.002 (0.002)	-0.003 (0.003)	0.000 (0.001)	0.000 (0.003)
P Permanent Income	0.005 (0.038)	0.174 (0.074)*	0.239 (0.115)*	0.030 (0.030)	0.172 (0.051)*	0.268 (0.078)*	0.002 (0.013)	0.182 (0.070)*
P Stocks/Mutual Funds	0.004 (0.005)	0.010 (0.010)	0.023 (0.018)	0.001 (0.004)	-0.014 (0.007)*	-0.018 (0.012)	-0.001 (0.002)	-0.004 (0.012)
Maternal Grandparents	0.045 (0.042)	0.108 (0.075)	0.276 (0.129)*	-0.003 (0.031)	-0.057 (0.050)	-0.159 (0.081)*	-0.024 (0.015)	-0.167 (0.087)
GP Married 1984	0.003 (0.003)	0.017 (0.006)*	0.016 (0.008)	0.006 (0.002)*	-0.004 (0.003)	0.000 (0.005)	-0.001 (0.001)	-0.003 (0.004)
GP Age	-0.004 (0.051)	0.103 (0.094)	-0.064 (0.162)	0.025 (0.039)	-0.074 (0.065)	-0.256 (0.099)*	-0.007 (0.017)	-0.052 (0.094)
GP Head Education	0.003 (0.007)	0.034 (0.015)*	0.067 (0.024)*	-0.003 (0.006)	0.011 (0.009)	-0.022 (0.015)	0.003 (0.003)	0.018 (0.014)
GP Head Occupation	0.001 (0.002)	-0.001 (0.003)	-0.006 (0.006)	0.003 (0.001)*	0.003 (0.002)	0.002 (0.003)	0.001 (0.001)	-0.002 (0.003)
GP Permanent Income	0.060 (0.045)	0.158 (0.089)	0.149 (0.136)	0.068 (0.033)*	0.052 (0.056)	0.145 (0.086)	-0.001 (0.015)	0.003 (0.080)
GP Stocks/Mutual Funds	0.008 (0.007)	-0.009 (0.011)	0.033 (0.021)	-0.008 (0.005)	-0.007 (0.008)	-0.032 (0.013)*	-0.002 (0.002)	-0.022 (0.014)

* 95% Confidence interval does not include 0.
Note: P represents parents and GP represents grandparents.
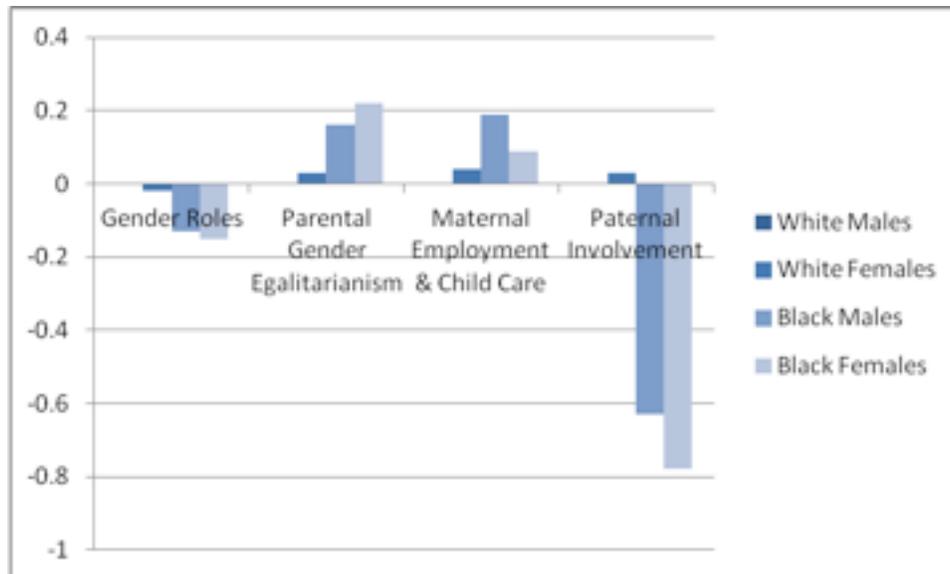
Figure 1. Standardized differences by child race and gender in parental embodied expressed responses to questions on gender norms and roles in parenting. (White males are the reference group.) Note: Based on multiple group confirmatory factor analysis.

act did not come from the human but was based on the more-than-human performative act of the amniocentesis test. The mattering matter of the technoscientific medical apparatus materially reconfigured the discursive boundaries of the fetus's body.

These interpellations that begin prior to the child's arrival in the world initiate the reiterative process of assemblages of "difference" both in parenting practices and parental gender roles. Anne Lamott even confesses to the chain of thoughts that were set in motion by learning that she was having a boy and the concerns of not having a father figure. Paternal involvement is believed to be important for many parents, especially those of white males and females (see figure 1). (Also, see table 2 and 3 for model fit and structural model estimates.)

The heteronormative and patriarchal belief in the importance of male parental figure involvement is not surprising but it is important to take note that it is not equally shared. For instance, parents of white male children, on average, expressed the importance of paternal involvement at 63% of a standard deviation greater than parents of black males and 78% of a standard deviation greater than parents of black females. When one considers the structural focus of social welfare policies on poor single mothers and the mass incarceration of black and Latino males since the 1970s, the sociocultural and historical conditions that likely contribute to these racialized and gendered differences become illuminating.

In distinction from what could be understood from the above data regarding black parents' beliefs in paternal involvement, in rap artist and actor Common's memoir, *One Day It'll All Make Sense*, his mom describes, "No matter what went on between Lonnie [Common's father] and me, it had nothing to do with Rashid [Common]. He didn't choose his father; I did. He should not have to pay because his parents' relationship didn't work. A son needs his father, and Lonnie always loved Rashid" (p. 26). By reading this narrative through the data in figure 1, the multiplicity of the statistical estimated difference begins to emerge. That is, as a black male who grew up in the predominantly black neighborhoods of the Southside of Chicago with a PhD

educated mother, Common's mother expressed an importance in paternal involvement that would have been overshadowed by the statistical estimate. This can also be understood as differences that make a difference.

Common also talks about what his experiences with race relations were like growing up within the racially homogenous and economically asymmetric time and space of the South Side of Chicago.

> Think about it: in my community, the richest person and the poorest person were black. You had black bankers and lawyers and businesspeople, but you also had black bums and hustlers and junkies. .... The point is, never in my life did I think that being black would help or hinder me in a way that I couldn't address with hard work. It just was. (pp. 26-27)

Common's narrative is an example of not just the iterative production of racialized visions of the world but also differentially formed practices of parenting as a result of the particularities of time and space.

What parents learn to do, know to do, and have the resources to do is always contingent on the assemblages of intra-action in time and space. We can see these assemblages materialized in the racialized and gendered pattern of responses to survey questions and observations pertaining to parenting practices.
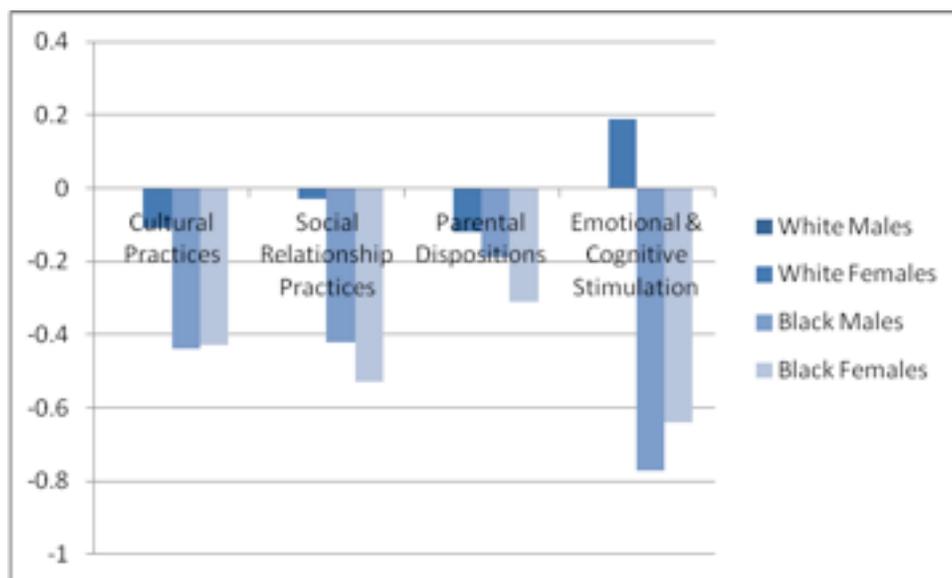
Figure 2. Multiple group analysis of parenting practices. Note: Based on multiple group confirmatory factor analysis.

For all four areas of parenting practices there are very clear racialized differences and less pronounced differences by child gender, where the biggest difference was in parental emotional and cognitive stimulation. While Common's above narrative points toward the ontologies of multiplicity as situated in time and space, the racialized and gendered statistical estimates of difference suggest the extent to which the racialized and gendered material and discursive

conditions of time and space enact assemblages of parenting performativities. Both of these forms of data read through one another illuminate a nuanced understanding of the within and between group variability that would have been otherwise buried.

In order to further unpack these racialized, gendered parenting performativities, I examine to what extent they are endogenous to parental embodied expressed responses to questions on gender norms and roles in parenting. Figure 3 presents the standardized raced and gendered statistical estimates of difference in parenting practices after accounting for parental embodied expressed responses to questions on gender norms and roles in parenting.
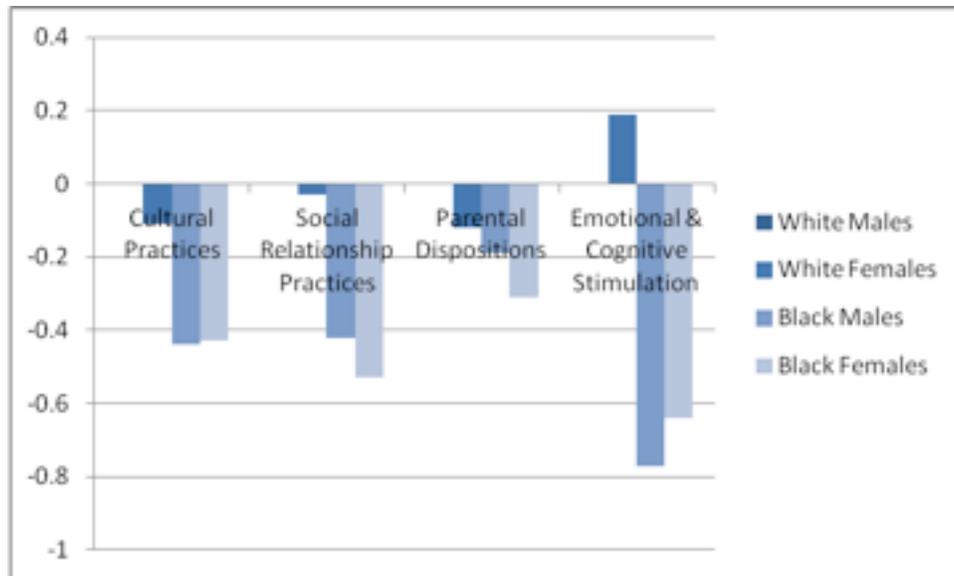
Figure 3. Multiple group analysis of parenting practices accounted for by parental embodied expressed responses to questions on gender norms and roles in parenting. Note: Standardized estimates.

In each area of parenting practices, the standardized statistical estimates of racialized gendered difference were reduced substantially, as much as 50% of a standard deviation for some parenting practices. Racialized norms in parenting practices are not just shaped in time and space but also by material and discursive forces of ontologies of gender.

Multigenerational Assemblages of Parenting Performativities

In order to examine the extent to which class structural relations have multigenerational effects on parenting practices, I examine the associations between the parents' and grandparents' socioeconomic resources with the parent's practices of parenting. Here, I am interested in examining the amount of variability in parenting practices that is uniquely accounted for by parental gender norms and roles, parent socioeconomic resources, and grandparent socioeconomic resources. Figures 4, 5, 6, and 7 present data for each measured domain of parenting practice.
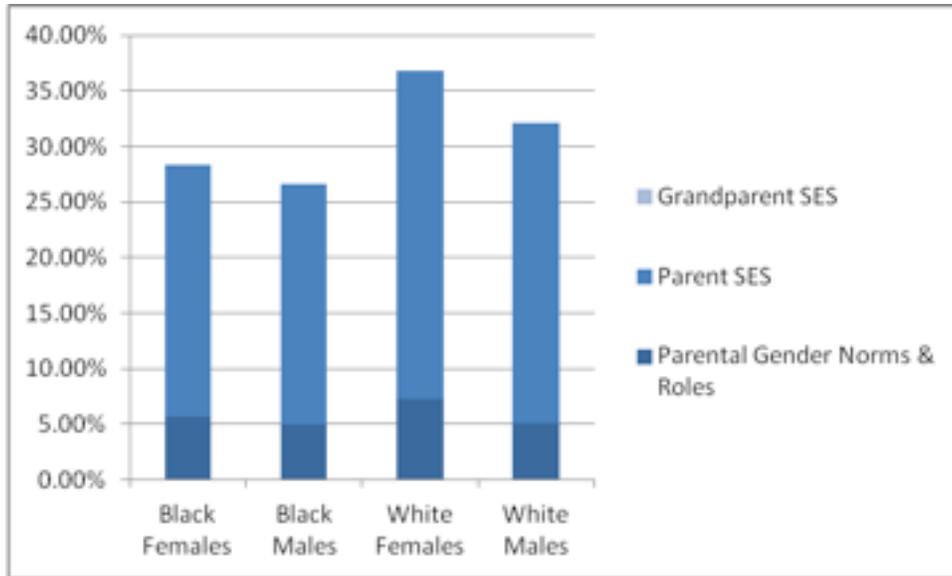
Figure 4. Percent of variability in cultural practices accounted for by parental gender norms & roles, parent socioeconomic resources, and grandparent socioeconomic resources. Note: Standardized estimates.
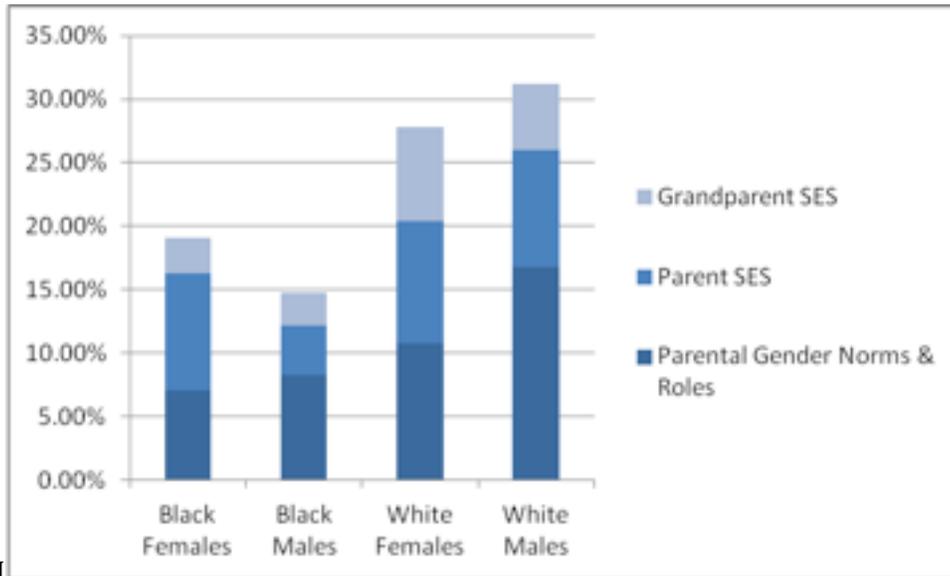

Figure 5. Percent of variability in social relationship practices accounted for by parental gender norms & roles, parent socioeconomic resources, and grandparent socioeconomic resources. Note: Standardized estimates.
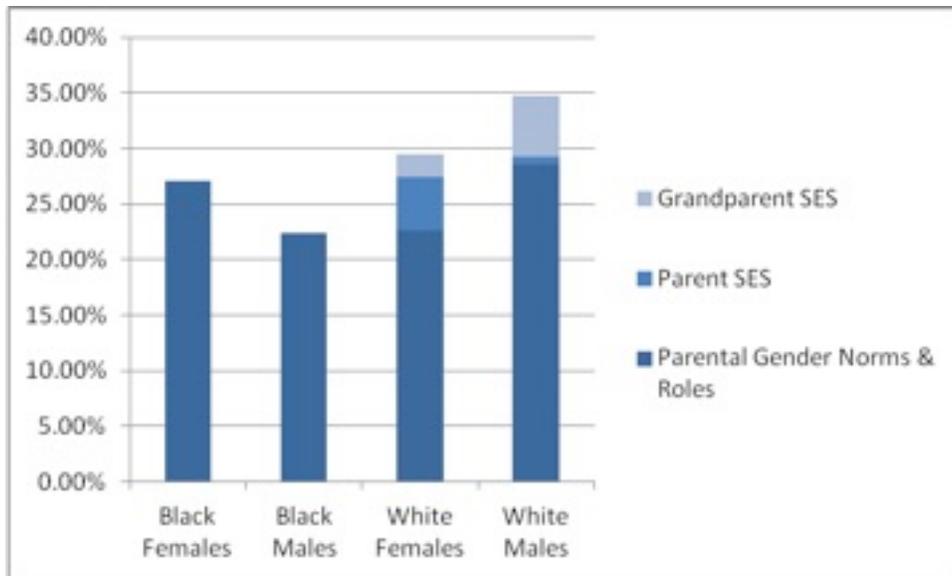
Figure 6. Percent of variability in parental expressed affect toward parenting accounted for by parental gender norms & roles, parent socioeconomic resources, and grandparent socioeconomic resources. Note: Standardized estimates.
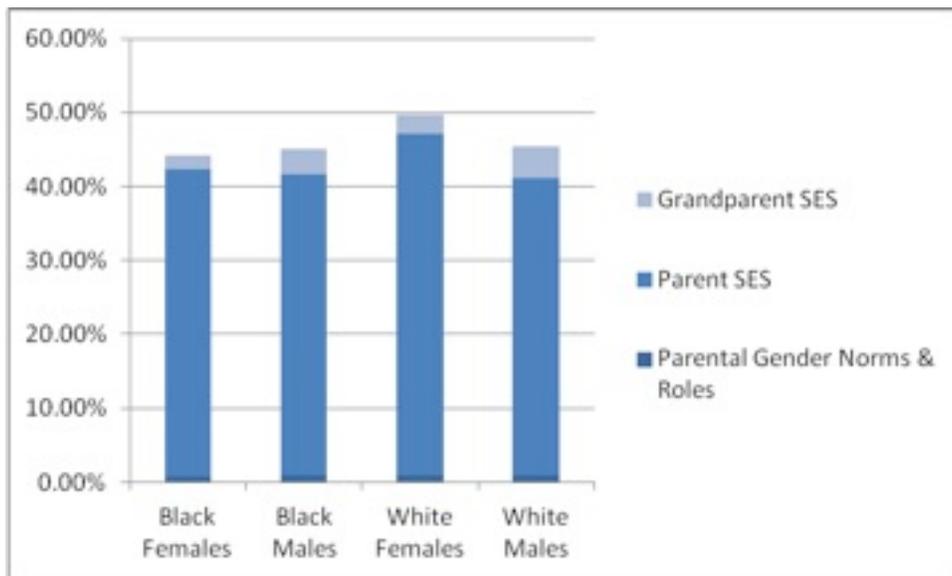
Figure 7. Percent of variability in parental emotional and cognitive stimulation accounted for by parental gender norms & roles, parent socioeconomic resources, and grandparent socioeconomic resources. Note: Standardized estimates.

As can be seen in the figures, parental social relationship practices are clearly endogenous to multigenerational social forces. While there are multigenerational effects on parental expressed affect toward parenting, this is only the case for white males and females. Finally, while there were multigenerational effects on parenting practices of emotional and

cognitive stimulation, parent socioeconomic resources seem to account for the majority of the variability. Thus, multigenerational class structural relations matter more for some parenting practices, less for others, and vary by child race and gender.

The Absence of Presence of Sexual Difference

Although we are able to analyze the raced, gendered, and classed assemblages of parenting performativities, the markings of sexuality haunt the above narrative and statistical estimates. The absence of presence of sexual difference is a result of the heteronormative lens of most pre-existing normal probability social science surveys, including the Panel Study of Income Dynamics. Despite this boundary-making practice, I want to diffractively read the above data through a source of digital visual media as a way of producing diffractive patterns that would have otherwise maintained a haunting in the data.

In a YouTube video that went viral, "How not to react when your child tells you that he's gay", we get a glimpse into the act and event when a young gay male from Georgia comes out to his homophobic family. After a brief debate on theological versus scientific perspectives on whether homosexuality is a choice, a female family figure states the following:

> I'm going to tell you . . . that you have chosen that path, we will not support you any longer. You will need to move out and find wherever you can to live and do what you want to because I will not let people believe that I condone what you do.

From there, it very quickly escalates to what we hear as his family members physically attacking him. In his reaction of questioning his family, "What is wrong with you people?" we hear a male figure (presumably his father) state, "No, what's wrong with you? . . . You are a disgrace. . . . Unfortunately, I'm sorry to say it but you are. . . ." The video ends on this somber tone.

His family members in this video, who include more than just his stated mother and father, make it clear that they understand his "choice" of homosexuality as unacceptable and will not be associated with him as such. This is one contemporary instantiation of the violent acts that continue to manifest as a result of the taken-for-granted divisions of nature and culture and the ways in which they inform even parenting performativities. The abjection of his family's performative acts didn't just disown Daniel but also produced a spacing between them and him, rendering the alterity of his body as not-quite-human.

Diffractively reading Daniel's story through the above data illuminates the differential patterns that haunt the multiplicity of the statistical estimates of parenting practices for white males. It's not a matter of whether the estimates "represent" the parenting practices of Daniel's white (gay) male experience, it's a question of how the parenthetical as read through this video might produce differential patterns in relation to the statistical multiplicities of parenting practices with white males.

Daniel's deconstructive social situation and, in particular, his parents' intra-active performative acts, diffractively read through the quantitative estimates of parenting practices with white males, highlights the complex and differentiated ontologies of the assemblages of parenting performativities. The statistically estimated relational differences between white males and black females, for instance, were substantial. These comparative estimates tend to be

interpretively reduced to essentialized ontologies of presumed given and separate groups. Diffractively reading Daniel's white (gay) male narrative through this data illuminates the boundary-making practices of not just the methods but, more importantly, parenting performativities. The intra-activity between parents and the assemblages of their child's ontologies are haunted by the parenthetical, producing differences that profoundly queer the received meanings of the statistical estimates of parenting practices with white males. The produced differences go beyond the multiplicities of parenting practices of emotional and cognitive stimulation to performatively enacting a cut of alterity, "deviance," and radical difference in the ontologies of the children.

Discussion & Conclusions

The data presented in this article indicate that there are multigenerational effects of material and discursive resources on parenting performativities. The assemblages of parenting performativities are produced by a myriad of forces some of which include the parents' adult material-discursive conditions as well as the conditions that they grew up in. We also learn about some of the complicated and contingent ways that parenting performativities are assemblages of structural relations of "difference." Parenting is an assemblage of performative intra-actions that enact boundaries in their offspring's ontologies that seek to enhance or maintain the social legacy of the family. The enacted boundaries may be by way of socializing how to be "male" or "female"; "black" or "white"; or "lesbian," "gay," or "heterosexual." The enacted boundaries are sometimes even in the violently ruptured spacing of disowning, so as to disassociate a family from the "chosen" "deviance" of its offspring. As assemblages, parenting performativities produce differences as modes of disciplining, socializing, and shaping the ontologies of their offspring so as to enhance or maintain the social legacy of their family. The statistical estimates of the complicated, messy, and contradictory performativities of parenting are often haunted, such that the statistical often produces singular narratives of that which is already a multiplicity.

Inherently, the study of social reproduction is the study of "difference." Thus, the examination of social reproduction is a comparative analysis of "difference". It is often the case that such comparative analysis falls into the colonialist trap of narratives of pathology and deficiency especially with phenomena such as parenting practices. Assemblage shifts the analytic lens away from identity toward the relations and connections of the sociocultural and historical conditions of the social events, actions, and situations of parenting. Thus, it inherently points to the structural conditions that relationally enact, produce, and shape the performativities of parenting. While every method produces data having a parallax view that is within and part of phenomena, the diffraction of multiple data sources brings into sight the differences within phenomena that complicate and mess up the neat and simplified narratives that are often produced from one data source; this is especially the case with the statistical. Thus, reading the data of one method through another enables the emergence of multiplicities that would otherwise haunt the singularity of method. For parenting performativities, the stakes are too high to not diffractively read for the assemblages of structural relations of "difference."

In becoming with the data, I want to consider how I am intra-actively produced by the process and phenomena of parenting performativities? In what ways am I mutually constituted by the analysis? As I read the data on the assemblages of "difference" in parenting performativities I was reminded of my own upbringing. I grew up in Poughkeepsie NY to

African American and Puerto Rican parents who grew up in poverty and were first-generation college graduates. I recall not just racialized discourses about how to be in the world but also clear distinctions in what we and other families of color did in contrast to my white peers. For instance, we would attend weekly service at the African Methodist Episcopal church, which was predominantly African American, while many of our white peers would attend one of the local catholic churches. The distinctions in material and discursive practices within time and space were, in part, what differentiated my brother and I from our white peers. Beyond the intra-acting cultural and historical conditions of the parenting performativities of my upbringing, I want to re-insert myself into the intra-acting fabric of the data so as to speak more directly to how the data affected me. The association of multigenerational resources with parenting performativities re-affirmed and shifted how I think about the intra-acting practices of parenting. As a new parent, I am evermore mindful of these processes as we participate in various early childhood activities and attempt to be more egalitarian in parental responsibilities while trying to minimize the gendered interpellations of our child. This diffractive reading of the data reveals multiple forms of knowledge on the ways in which assemblages of "difference" in parenting performativities are intra-actively reconfiguring society, parents, and their offspring, as well as the power relations embedded in these processes.

The Quantitative Turn in Critical Inquiry

In this article I discuss a new materialists approach to quantitative methods for critical inquiry in education, and demonstrate how to do this with multiple methods and sources of data on multigenerational processes and parenting performativity. Using quantitative models of panel study data, memoirs, and a viral YouTube video, I diffractively read through the tensions and differences in the data in order to illuminate that which would not have appeared otherwise with the singularity of any one of these methods. Overall, the data from the empirical demonstration suggests that parenting practices are a result of myriad forces that cannot be reduced to pathology or deficiency but rather convey the inheritance of constraining, disenabling, and even violent sociocultural and historical conditions. In order to illuminate the multiplicities in the boundary-making practices of parenting performativity a diffractive methodology is critical to the study of the assemblages in parenting practices.

As a method of critical inquiry, diffraction shifts the analytical lens from sameness to difference. Although 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, reflexivity seeks to reflect on the representations of reality from a distance. As Barad exclaims, reflexivity simply mirrors the mirroring logic of representationalism; thus, an optics toward sameness and not difference. As a method focused on the tensions, disjunctures, and differences between the boundary-making practices of varied methods and the produced differences in the data that make a difference, the heterologous lens of diffraction provides a new method of possibility, especially for the performative acts of quantification.

Given recent work in new materialisms and cultural studies of mathematics (Barad, 2007; Dixon-Román, 2016; Kirby, 2011; Rotman, 2000), the ontological and epistemological assumptions of quantification have been redefined. We no longer can understand number as a simple signifier or abstraction of natural phenomena, but rather as multiplicity. As a world increasingly employing the metrics of quantification in everyday reconfiguring power relations,

critical inquiry in educational research can no longer afford to maintain a hermeneutics of suspicion toward the methods of quantification. Critical scholarship must find ways of making interventions from within and through the methods of quantification, and the current article provides one onto-epistemological instantiation. It seems to me that this is not simply a call for a new line of critical inquiry, but an urgent and necessary turn toward enabling possibilities.

Appendix: Variable Operationalization from PSID

Dependent Variables: Parenting Performativity

Parenting Dispositions & Practices. Parenting practices were measured with a battery of items on parenting in the Child Development Supplement. Each item was factor analyzed constructing a close fit three factor structure $\left(\chi^2 = 987, df = 218, \varepsilon_a = .03, CFI = 0.91, TLI = 0.94\right)$, where an RMSEA $\left(\varepsilon_a\right)$ of .05 or less and a *CFI* or *TLI* of .90 or higher indicates a plausible model. These four factors measured: cultural practices, social relationship practices, and parental expressed affect toward parenting. The composite measure of parental cognitive stimulation and emotional warmth from the Home Observation for Measurement of the Environment scale (HOME; Caldwell & Bradley 1984) was included as an additional measure of parenting practices. The three latent variables and the HOME scale were employed as dependent variables of parenting practices.

Independent Variables

Embodied Expressed Responses to Parental Gender Norms. The CDS contains eighteen items that measure parent's beliefs about gender roles, maternal employment, paternal involvement, childcare, and parental gender egalitarianism. These items were factor analyzed and included in the models as a measure of parental embodied expressed responses to parental gender norms. Both measurement models of expressed responses to parental gender norms, affect toward parenting, and parenting practices had a close fit to the data (see table 2).

Family Socioeconomic Background Measures

Permanent Income. Permanent income is an average of family income over multiple years so as to account for both simple measurement error and transitory shocks (Mazumder, 2005). The parents' total family income was averaged over four years (1993, 1994, 1995, and 1996) to arrive at their permanent income estimate. The grandparents' permanent income was estimated over fifteen years: 1975 through 1989. This captured the grandparents' permanent income when the parents were on average between the ages of 12 to 26.

Wealth. As a liquid asset, the net total value of stocks/mutual funds was used for both parents in 1994 and grandparents in 1984.

Occupational Prestige. Occupational prestige was measured in the same manner for both the parent/caregiver head in 1997 and grandparent head in 1984. Occupational prestige was measured by the Hodge-Siegel-Rossi prestige score (see Nakao, Hodge, & Treas, 1990).

Educational Attainment. The 1997 parent head and 1984 grandparent head educational attainment were measured as defined by the PSID in actual number of years up through 17 years of education which would represent some post-graduate work.

Control Variables. The parent's and grandparent's age in 1997 and 1984, respectively, were controlled for in the models as well as whether maternal or paternal grandparents, and the parent's and grandparent's marital status. The child's race, gender, and age in 1997 was also included.

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