Political, relational, and complexly embodied; experiencing disability in the mathematics classroom

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ORIGINAL ARTICLE

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Abstract

The academic field of Disability Studies (DS) offers theoretical tools to understand how social practices intersect with embodiment, long a critical issue in DS because disability is a category of human difference that is always already embodied. I review two theories that seek to resolve this dichotomy between the body and social worlds: complex embodiment (Siebers, Disability theory, University of Michigan Press, Ann Arbor, 2008) and the political/relational model (Kafer, Feminist, Queer, Crip, Indiana University Press, Bloomington, 2013). I use these theories to analyze ethnographic data and narratives of a Latina named Desi around disability and mathematics. Desi's narratives explored experiences relating to Attention Deficit Hyperactivity Disorder, Learning Disabilities, and mathematics anxiety. Desi's narratives described disabilities as socio-political constructs, involving relations of power and exclusion, as well as acknowledging the physiological, embodied experience of some differences in relation to mathematics. Through this analysis, I argue for the inclusion of emotion in embodiment, and the use of narrative analysis paired with ethnography as a tool to understand embodied experience.

Keywords Disability studies · Embodiment · Mathematics · Disability · Narrative

1 Introduction

This special issue explores the material dimensions of learning mathematics, paying special attention to how the human body intersects with social and political practices. The academic field of Disability Studies (DS) offers tools to understand embodiment, long a critical issue in DS because disability is a category of human difference that is always already embodied. This paper explores theoretical work in DS that reconceptualizes the relationship between bodies, minds and social worlds (Kafer 2013; Siebers 2008). These theorists call attention to how bodies, minds and cultural representations are co-constructed; how cultural representation maps onto the body and how the body shapes cultural representations. These theories can develop our understandings of how social constructions such as disability are mapped onto how mathematics class feels.

DS is an interdisciplinary academic field founded by activists with disabilities[1] (Linton 1998) who rejected the medical model of disability because of the focus on individual deficits and cure. Instead, activists and scholars proposed the social model, in which impairments (differences in the body) are separate from disability. Disability is defined as the political and social oppression of people with disabilities through lack of access to society (UPAIS 1975). While the social model has been an effective theoretical and activist tool, it has been critiqued within DS because the social model creates a disconnect between the body and disability, removing the body from critical analysis (Wendell 1996).

I review two theories that seek to resolve this dichotomy between the body and social worlds: *complex embodiment* (Siebers 2008) and the *political/relational model* (Kafer 2013). Both DS theorists make connections to feminist, queer and critical race perspectives. Using data from a longitudinal research project on identity in mathematics (Lambert 2015, 2017), I use these theories to analyze narratives and observations of a Latina named Desi, exploring both how disability feels to Desi, and how disability is constructed in her mathematics classroom.

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[1] While person-first language is preferred in the US, I alternate between person-first and identity-first language as some disabled activists prefer identity-first language to communicate disability as a valued identity (ASAN 2018).

As these narratives return continually to emotion, I argue for the inclusion of emotion into the study of mathematical identities and embodiment. Research on emotion in mathematics has traditionally focused on individualist, trait-based conceptions of emotion (Eligio 2017) and continues to be critiqued for the use of ill-defined constructs such as affect, emotion, beliefs, feelings, motivation (Hannula 2012). I follow those who insist on the artificiality of separating emotion from cognition; "our thinking is *necessarily* embodied *and* emotional" (Radford 2015). Roth and Radford (2011) describe affect as impossible to separate from activity, analyzing the visible and audible expressions of emotions in the activity, not linguistic representations made afterwards (i.e. interviews). Scholarship in embodiment tends to focus on aspects of the body outside of language: gesture, rhythm (Bautista & Roth, 2012), and how prosody in sound emerges across groups of students (de Freitas & Sinclair 2014). This body of scholarship does not privilege individual accounts of learning preserved in language, critiquing the assumption that language transparently represents thought/embodied experience.

Including emotion in studies of embodiment and identity is critical yet challenging both theoretically and methodologically. Different methodological choices are typically made by scholars analyzing identity in mathematics, who have used narratives to explore the role of emotions in mathematics (Andersson, Valero, & Meaney, 2015; Heyd-Metzuyanim 2015). This tradition includes sociocultural (Heyd-Metzuyanim 2015), psychoanalytic (Black, Mendick,Rodd, Solomon, & Brown, 2009) and discursive approaches (Evans, Morgan, & Tsatsaroni, 2006). While these studies focus on emotional aspects of learning mathematics, typically anxiety, this scholarship is not included in research on embodiment. Arguably, however, emotion as a physiological response and cultural construction belongs in scholarship in both identity and embodiment. In this paper, using the theory of complex embodiment (Siebers 2008), I explore how embodiment could include both observational and narrative data, and how perhaps the combination of such data can illuminate new possibilities for understanding emotion in mathematics for those with disabilities.

My focus on narrative comes from the field of DS which, like feminism and critical race scholarship (Collins 2002; Harding 2004), privileges the narratives of insiders (Ferri 2011); only from "outside" the status-quo can new visions of society be imagined. The narratives of Desi, the young Latina at the heart of this paper, are thus theoretical tools, as this young person seeks to explain to me, the researcher, how disability operates in her experience of learning mathematics in American schools. I use narrative then as both a methodological and a theoretical tool.

In this paper, I will first explore critiques of both the medical and social models of disability, exploring as examples three disability categories that emerge from Desi's narratives: Attention Deficit Hyperactivity Disorder (ADHD), Learning Disability (LD), and math anxiety. I will then describe complex embodiment (Siebers 2008) and the political/relational model of disability (Kafer 2013). After summarizing the methodology of the study from which these narratives are drawn, I will present data that I use to explore complex embodiment and the political/relational model of disability.

2 Conceptual framework

2.1 Medical vs. social models of disability

Post-Enlightenment, Western culture understood disability as a disease that can and should be cured (Shakespeare 2006). This *medical model* of disability explains physical and mental differences through the lens of medicine, engaging in a process designed to fix the deficit in the individual. Disability is seen as an individual problem, not a social or political one. The medical model had practical benefits for people with disabilities compared to previous theories of disability, which connected disability to moral failings. However, the medical model has been a point of contention for disabled people, critiqued because it isolates individuals with disabilities from society and each other, perpetuates understandings of disability as illness, and ignores how culture and environments affect people with disabilities (Shakespeare 2006; Oliver 2009).

The *social model* developed from the work of a group of disabled activists in Britain in the 1970s, the *Union of Physically Impaired Against Segregation* (UPIAS). This group of activists was made up primarily of white men with physical and/or mobility impairments. In this model, *impairment* is separated from *disability*. *Impairment* refers to physical differences, such as paralysis. *Disability* is reserved to describe how society disables individuals, in the form of inaccessible environments that do not allow disabled people to participate fully in society. The social model has been an important tool in the Disability Rights movement, focusing attention on increasing access for people with disabilities (Oliver 2009).

Two major critiques of the social model have emerged. The first major critique is that it creates a binary which separates the embodied aspect of disability (impairment) from the social aspects, effectively alienating people with disabilities from their own experience. This critique comes from feminist perspectives, as well as from those who have quite different embodied experiences of disability, particularly illness and chronic pain (Wendell 1996). Second, by separating the political from the body, the social model leaves the body unexplored theoretically. The failure to analyze impairment ignores the biomedical disciplinary practices that construct

disability categories (Tremain 2006), as "the materiality of 'the body' cannot be dissociated from the historically contingent practices that bring it into being"(p. 188). If impairment is separate from disability, and only disability is under analysis, we leave diagnosis untheorized. The social model has had significant benefits in terms of activism, towards reframing disability as a social rather than a personal problem (Shakespeare 2006). But the social model constructs binaries that lead to additional theoretical problems, similar to the divide between embodiment and the social in this special issue. In DS, as Sieber writes, "the disabled body pushes back"(2008, p. 2), disallowing this theoretical dichotomy through theorizing within the experience of disabled bodies.

To explore these critiques, I will describe three different disabilities that emerge from Desi's narratives. Each is a relatively new conceptualization of a disability, having been defined in the twentieth century. All are closely identified with schooling. Desi had an Individual Education Plan (IEP) that categorized her under Learning Disabilities. However, Desi never used that term with me, instead identifying as a person with ADHD. In addition, Desi's narratives express a high degree of anxiety around math, although neither she nor her teachers identified her as a person with math anxiety. At the time of this study, math anxiety was not a label that was commonly applied to individual students in schools, particularly not at the elementary or middle school level. These disability categories are judgmental, meaning that they lack behavioral or physiological markers and must be diagnosed using observation or comparison with peers, implicitly defining a normal and an abnormal (Reid and Valle 2004). In the next section, I will briefly discuss each of these disabilities in turn, suggesting how the medical or social model might be defined in each. I do not seek to name which disability Desi "has;" to the contrary, these multiple overlapping disabilities illustrate how complex the process of labeling is, and how "labels" are felt and experienced.

2.1.1 Attention deficit hyperactivity disorder

Through a medical model, ADHD is understood as a neurological, hereditary condition that causes some individuals to have deficits in attention. The history of ADHD in the twentieth century has been deeply connected to pharmaceutics, with research in the use of amphetamines to control behavior as early as the 1930s (Bradley & Bowen 1941). It is diagnosed in the US by a doctor, not by schools, using a checklist that asks if the individual pays the right kind of attention in different situations, and places the doctor in the role of the decider of what kind of attention or movement is normal or abnormal in each case. For example, the diagnostic manual DSMV includes the following as a part of the diagnosis, "Often runs about or climbs excessively in situations in which it is inappropriate" (APA 2013). It is not

the behavior of climbing that is a disability, but the context in which a child climbs that makes the climbing evidence of a disability. Criteria for ADHD are designed around the typical behavior expectations of schooling, such as staying in a seat during a lesson (Graham 2007). Scholarship has explored the social model in relationship to ADHD, exploring how the demands of schooling construct disability and how social constructions of ADHD circulate in society (e.g. Honkasilta 2016).

2.1.2 Learning disability

While Desi identified as having ADHD, the disability category on her IEP was for a Specific Learning Disability. In the medical model, LD is conceptualized as a processing disorder originating in the central nervous system (Scanlon 2013, p. 27). Critiques of the validity of the construct and diagnostic techniques have been a part of the concept of LD since its inception (McFarland, Williams & Miciak, 2013). Significant scholarship analyzes LD from a social model perspective, as a set of cultural practices, rather than a clearly defined impairment (Collins 2012; Dudling-Marling 2004; Reid & Valle, 2005). For example, LD can be understood as produced through interaction; children must be seen in a context, doing particular actions, to be seen as LD by teachers (McDermott, Goldman & Varenne, 2006). Scholarship in mathematics has analyzed how LD is produced through classroom practices, as well as through particular ways of labeling and interacting with students (Ben-Yehuda, Lavy, Linchevski, & Sfard, 2005; Heyd-Metzuyanim 2013).

2.1.3 Mathematical anxiety

The final disability explored in this paper is math anxiety. Math anxiety is understood not as mathematical LD, but closely related to test anxiety (Dowker, Sarkar, & Looi, 2016). Researchers estimate that math anxiety is common, with an estimated 17% of the population with high levels of mathematics anxiety (Ashcraft & Moore, 2009). Math anxiety has two components: the cognitive aspect, or thoughts of "worry" about mathematics, and the affective aspect, feelings of nervousness and tension during mathematical situations particularly testing (Dowker et al., 2016). Another aspect is the physiological reactions such as nausea and headaches. Math anxiety has typically been understood as a stable individual trait, with research shifting to understanding anxiety as a transitory state (Eligio 2017). A recent summary of 20 years of research described genetics, gender, age and nationality as factors that influence math anxiety, without mentioning curriculum or social contexts (Dowker et al., 2016).

A number of scholars in mathematics education have described math anxiety from a social lens, particularly in

investigations into identification processes with mathematics for students (Andersson et al. 2015; Heyd-Metzuyanim 2015) and teachers (Stoehr 2017). Heyd-Metzuyanim writes, "Mathematics anxiety cannot be thought of as a strictly individual phenomenon. A whole *discourse* on which such an anxiety can thrive has to surround the student in order for it to develop"(2015, p. 545). Stoehr (2017) found pre-service teachers who experienced math anxiety had multiple experiences of math anxiety across their life-span, beyond testing situations. Evans and colleagues (2006) use positioning theory to describe how math anxiety arose from how a student was positioned by peers in a small group. Black and colleagues (2009) use psychoanalysis to describe anxiety, understanding selves as forged out of the work of resisting anxiety.

In the next section, I will describe the work of two theorists in DS who have proposed new models of disability that move beyond the binary represented by the medical and social models.

2.2 Complex embodiment

In *Disability Theory* (2008), Tobin Siebers develops connections between critical and cultural theory from a DS perspective, allowing DS to transform taken-for-granted assumptions about identity, ideology and the body. He seeks to understand the relationship between the body and representation using disability as a theoretical tool. Lastly, he explores disability as a minority identity, putting disability into conversation with theorizing of other identities.

Siebers rejects both the purely social model, as lacking in attention to embodiment, and the medical model, which defines disability as individual and requiring medical intervention. Siebers defines disability as "a social location complexly embodied"(p. 14). In this formation, disability is not solely within the body, within impairment. Nor is disability a social construction. It is both, from the beginning. He proposes new ways of integrating social and bodily aspects of disability, particularly by proposing the concept of *complex embodiment*.

Embodiment includes forces innate to the body, which Siebers describes not as a rational, closed body, but instead as "a living entity, the body is vital and chaotic, possessing complexity in equal share to that claimed today by critical and cultural theorists for linguistic systems"(p. 26). The body has a life of its own, and disability brings attention to that complexity. Complex embodiment allows for a particular kind of situated knowledge, one that "adheres in embodiment"(p. 23). Embodied knowledges are themselves produced through cultural processes; language to describe our bodies does not spring from a neutral source. Thus when we describe a body, we use concepts formed in social worlds, which in turn shape our bodies. He calls

for critique which maps the construction of ideology onto bodies: "precisely because ideologies are embodied, their effects are readable, and must be read, in the construction and history of societies"(p. 32).

Siebers casts a wide net in understanding embodiment. He focuses particularly on pain, arguing that the social model (and social constructivism in general) do not adequately theorize the experience of pain. He describes a moment in which he is walking with colleagues, and sees a stair case ahead. While his colleagues presumably do not think about the stairs, Siebers must consider whether he has the strength to go up the stairs, and what the effects might be later if he chooses to do so. Not going up the stairs, and thus separating from an interesting discussion, has an embodied effect of its own, an emotional weight. Emotions are embodied, as are the physical sensations of pain and fatigue.

Siebers argues that attention to the body can never be an afterthought when interrogating disability, because the body is the site of political resistance. He writes, "The most urgent need for disability studies is the political struggle of people with disabilities, and this struggle requires a realistic conception of the disabled body"(p. 68). In short, Siebers rejects this distance created between embodiment and society, arguing that it is exactly *in* disabled bodies and minds that politics resides. This suggests that we must seek to better understand how individuals with disabilities understand their own experience, privileging narrative as a source of data.

Siebers calls for a dismantling of the sharp divide between the mind and the body. Following DS scholars Margaret Price (2009) and Sami Schalk (2018), I use the term *bodymind* to call into question the false Cartesian duality between body and mind. Price discusses how this term relates to both her mental illness and autoimmune disease; her body is felt in her mind, and her mind in her body. For both Price and Schalk, bodymind is materialist and feminist, a necessary way of grounding theory in the body. Bodymind is not just both body and mind, rather body and mind are inextricable and reciprocal. Emotions belong not just to the mind, but to the body. Coupled with complex embodiment, this theoretical work is important when trying to understand Desi, who describes how it feels to learn mathematics, and how math class feels, in emotional, embodied language.

2.3 Political/relational model

Using DS, queer and feminist theory, Alison Kafer's book, *Feminist, Queer, Crip* (2013) argues that utopias exclude disability, as if a good future depends on erasure of disability. Kafer is critical of the medical model, but "wary of a complete rejection of medical intervention"(p. 4). Her model, the political/relational model,

(n)either opposes nor valorizes medical intervention; rather than simply take such intervention for granted, it recognizes instead that medical representations, diagnoses, and treatments of bodily variation are imbued with ideological biases about what constitutes normalcy and deviance.(p. 6).

In her reading, people with disabilities want access to medical care, but they reserve the right to critique those interventions, and to understand these interventions within a social context. For Kafer, the body and the social world are not separate, and must always be read in context, and in dialogue. Kafer also critiques the social model, "asserting a sharp divide between impairment and disability fails to recognize that both impairment and disability are social"(p. 7). She advocates, like Siebers, for a realistic understanding of disability through acknowledging the body.

Kafer proposes a *political/relational* model that views disability as a site of shifting definitions that is felt, particularly in relationship to concepts of normalcy. First, identity is destabilized. Kafer uses queer theory to destabilize taken-for-granted notions about the body, to reveal the maps of how society writes on the body and how the body writes back (Halberstam 2005). She explores normative aspects of everyday life that become implicated in definitions of disability. Time, for example, is closely linked to concepts of disability in school. Kafer describes how the medical field defines disability in relationship to time, using terms such as delay, frequency, and incidence, defining people in relationship to particularly delineated futures that must occur along particular timescales to be "normal." As Haberstam notes, "normative narratives of time form the base of nearly every definition of the human in almost all of our modes of understanding" (Haberstam 2005, p. 162).

Second, disability is produced in interaction, always relational and political. Kafer inserts the political into her definition to speak back to the pervasive construction of disability as operating outside politics. We depoliticize disability when diagnosis is assumed to be scientific truth, even as these diagnoses shift over time, and if social issues are excluded from analysis of disability. For example, traditional special educational research tends to label DS as "ideological," and its own work as "pragmatic" (Brantlinger 1997). Instead of understanding all constructs of disability as embedded in political contexts, special education claims a non-ideological position, outside of culture. However, disability is always political and implicated in relationships of power; Kafer asks, "How is the category of disability used to justify the classification, supervision, segregation and oppression of certain people, bodies, and practices?"(p. 9). Special education is a system designed to do just that: classify, remediate and segregate students based on particular conceptions of disabilities (Linton 1998). With the word relational, Kafer

reminds us that the political is not situated in impersonal institutions, but interactions with other people. The work of the special education system is done by individuals whose role is to notice and report disability.

The political/relational model offers multiple ways to analyze ADHD, LD, and math anxiety. Each can be understood as political, as constructed by social settings, particularly schooling. Each can be understood as relational, in both senses of the word. First, all exist in relationship to a presupposed "normal" mind, or ablemindedness, and thus the definitions shift and overlap. Second, all are situated within human relationships. I acknowledge that some readers may be uncomfortable with the ways in which these disability categorizations are applied, and not applied, to Desi. While most academic research on disability seeks to find definitive diagnosis, here I present one disability that Desi identifies with, one that she is identified with, and a third that is merely suggested by her narratives. Kafer's work allows us to understand these differences as provisional, and as shifting. Desi does not "have" math anxiety, instead anxiety is distributed across the context of her classroom providing a narrative of anxiety that Desi takes up.

These differences also suggest that an analysis of time can be a productive way to theorize disability in schools. LD hinges on definitions of processing, or a way of understanding thinking in relationship to time; to think more slowly is to move away from ablemindedness. Dyscalculia can be defined in relationship to time based on the time it takes to identify the larger of two quantities (de Freitas and Sinclair 2016). Psychometric concepts pose a normal and abnormal time to complete tasks such as recalling digits backwards, defining those who are slower as disabled. Time also factors into standards, mandating what mathematical content should be learned by children based on age. It suggests narratives of typical versus atypical development, hinged on a temporal conceptualization of development.

3 Methods

My research asks how one Latina named Desi both (1) engaged in her mathematics classroom and (2) narrated her experiences in mathematics class over 2 years. This data was collected as part of a 2-year longitudinal research study on how Latinx middle school students with disabilities constructed identities as mathematics learners (Lambert 2015, 2017). I followed nine focus students in their sixth and seventh grade mathematics classrooms. Data included multiple interviews with focus students and teachers, participant observation and field notes in 26 mathematics classes, and video recordings of 13 of those mathematics classes. Desi was chosen as the case to explore these two theories because her narratives

consistently included emotion, embodiment, and explicit discussion of disability. Desi was the only focus student who explicitly identified with a disability category, making her case unique in the data set. Desi's first interview was conducted in November of her seventh-grade year. The second interview was conducted in June of her seventh-grade year.

In other papers on this project (Lambert 2015, 2017), I have used sociocultural theory to understand individuals developing in figured worlds (Holland, Lachiotte, Skinner, & Cain, 1998). To understand the figured world of the classroom, I relied on ethnographic field notes and video analysis of the classroom, as well as interviews. To understand individual students' development within this figured world, I used interviews with students, contextualized with field notes and video analysis. As noted, most work in embodiment relies on observations of student participation. While I include observations, I also analyze student narratives about their experience learning mathematics. I do so not to triangulate, which suggests a positivist approach to the data, but to see the problem from multiple points of view, which can present both similarities and points of incongruence which are important in analysis. In analysis and presentation of data, I have sought to preserve multiplicity and complexity in narratives, not seeking to find answers or define children.

I use narrative analysis (Riessman 2007) to analyze Desi's narratives, which were first extracted from the interview transcripts. These interviews were analyzed thematically, structurally, and dialogically for participants' meaning-making around ability, disability and mathematics. Structural analysis is a close reading of the text, attentive to how the narrative is constructed. For example, I look for places in which speakers pause, searching for a word, as indicators of uncertainty. Dialogic analysis understands narrative as inherently heteroglossic, or that language circulates in social contexts, for example when Desi reuses the language of her teacher around effort. Dialogic analysis also considers how narratives are framed as dialogue, for example using reported speech to frame a story as an imagined dialogue.

I identify as a nondisabled white woman, a former special education teacher in urban settings with majority African-American and Latinx students. I used a longitudinal design so that I could develop relationships with students, as well as better understand development over time. By her second interview at the end of her seventh-grade year, I had built a relationship with Desi over more than a year and a half, spending significant time with Desi in class. The research site was a middle school in a predominately Latino neighborhood, whose students were 91% Hispanic, 6% African-American, and 3% white and Asian. Nine percent of the students were classified as English Language Learners. Fifteen percent of the school qualified for Special Education services, each with an Individual Education Plan (IEP).

Students with disabilities were educated in general education classrooms.

4 Desi

While the larger study included nine focus students, this paper focuses on Desi. Twelve years old at the beginning of the study, Desi identified herself as a "girl" and "from the Dominican Republic." Desi is bilingual in Spanish and English. Desi was a powerful social and moral force in both her sixth and her seventh-grade classrooms. In her eighth-grade year, I observed Desi delivering a bilingual poem that touched on her identity as Dominican, her sense that adults tried to control her in school, and her rejection of "labeling." Her peers applauded her loudly, and I heard one boy say, "Desi is the best poet in the school." Desi identified most clearly as a poet and an activist, one who did not see mathematics with the same passion as she did literacy.

In interviews, Desi was spirited and thoughtful. She frequently questioned the actions of her teachers while never disparaging them. She was particularly attached to Ms. Marquez, her seventh-grade math teacher who was Latina. Desi spoke of the "respect" that she felt from Ms. Marquez. Desi repeatedly attributed her success in mathematics in seventh grade to their relationship. In addition to her focus on relationships with teachers as a critical piece for her learning, Desi repeatedly narrated mathematics class as a place in which she felt strong emotions, mostly negative ones: "confused," "butterflies," "panic," "I blank out," and "I loathe." She described learning mathematics in elementary school as, "I hated it [smiling] with all my guts."

When I observed Desi in her sixth-grade mathematics class, I noticed that while she chatted with friends before class, she did not work with peers during class. In field notes, I described Desi as sitting very still, frequently not moving or speaking with other students, even as the students around her worked together boisterously. She sat quietly until a teacher came over to work with her, and then would engage with the teacher in the mathematics. In interviews, her sixth-grade teachers described her as "needy," noting that her behavior was "apathy-based because she is just disinterested." One teacher noted that there have been a few moments that were exceptions when Desi was "really into" her math work and "loves it when she knows." Both teachers used psychological notions to explain and understand Desi, and stressed her passivity and apathy in math class.

When Desi moved to seventh grade, she shifted into a more engaged presentation in mathematics. Her teacher, Ms. Marquez, rebuked her for waiting for a teacher, stressing that Desi's individual effort mattered. Desi endorsed that narrative, describing in subsequent interviews how important effort was in mathematics. In contrast to sixth-grade, Desi

began engaging with her peers and discussing mathematics. At one point, Desi was so interested in a small group discussion led by her teacher on adding and subtracting integers, that her body stretched across two desks so that she could gesture onto the white board in her teacher's hands. As an observer, her stretching felt different, as if Desi was stretching towards mathematics, towards her teacher, rather than sitting still. This new engaged presentation was not consistent across the schoolyear. There were periods of time in which Desi was more or less engaged, however, she never returned to the patterns of behavior of her sixth grade year.

In the seventh-grade classroom, speed and competence were closely connected, evidenced in interviews with students and in classroom observations. Students tended to construct two categories: those who *get it fast* and those who *struggle slow*. There were exceptions, students who understood mathematical competence through alternative conceptions, primarily that asking questions and developing unique strategies were other ways to be good at mathematics.

4.1 Attention, anxiety and learning, complexly embodied

In this section, I will use complex embodiment to understand Desi's narratives about how learning mathematics *feels*, and how she makes sense of those feelings.

4.1.1 Attention

At one point her sixth-grade math class, Desi told me, "Normally I would be zooming out. We zoom out" during class. That was "why most of us like to sit next to the window," cause then "I am in my own little planet" and "in my world." Here we have a collective, embodied description of those who "zoom out." That group, according to Desi was herself and a group of boys, who also had IEPs. Her description of zooming seemed entirely internal, as Desi didn't move around during class, and her body was unusually still. Desi's description of zooming as related to attention challenges normative concepts of ADHD, which stress an excess of energy or hyperactivity.

When interviewed early in her seventh grade year, Desi's narratives about mathematics in the fall of seventh grade emphasized her perceptions of how "good" students learn mathematics through a particular kind of attention. When I asked her, "Who stands out in your math class?" she named certain students as "good." She narrated how these students learned:

Desi   They pay attention [*gestures hands moving straight forward*]. It is like they are a movie, or a computer, and they just suck it all in [*gestures with hands around her brain*], like a sponge, until they absorb every little piece of it [*gestures grabbing tiny pieces of something in front of her*].

Notice in the previous narrative how closely she relates ability to attention, beginning with "they pay attention." The primary characteristic of the "good" math student is attention, and then memory, or being a "sponge." Her final gesture suggests that the kids are sucking in things—understanding mathematical knowledge as isolated bits and pieces.

Desi explicitly identified with ADHD, telling me in an interview that "I have ADHD." Desi identified with ADHD consistently across these 2 years, both to her teachers, to me, and to her peers, insisting in multiple narratives that ADHD exists, and that she pays attention in ways that were different from peers who appeared to symbolize ablemindedness.

4.1.2 Anxiety

In contrast with ADHD, Desi did not identify with anxiety. Rather, much as other students did in her class, Desi used circulating language around anxiety, panic, and forgetting that was particularly connected to testing. Desi described her process during tests; "On tests, I tend to, like, panic, and then if I like, study something I for-, it is like I blank out, completely. So, with tests, I don't test well." Desi called attention to how difficulties remembering feel. For Desi, this process begins with panic. When you feel panic, you forget, or blank out. This narrated process echoes the hypothetical process at the heart of math anxiety (Ashcraft & Moore [2009]). When a person feels anxiety while solving a problem, that anxiety interferes with working memory, necessary to solve mathematics problems. The person then cannot access their memory, or as Desi described it, "blank out." Notice the end of Desi's narrative, in which she summed up her narrative by stating, "I don't test well." This is a widely recognized phrase in the US, a separation between knowing and testing that preserves competence, suggesting that the knowledge exists in her mind, just not demonstrated on tests. This anxiety is both felt through the strong emotion of panic, and affected by cultural representations that name and describe those feelings.

Luo, Wang, & Luo ([2009]) describe math anxiety as "a cognitively passive mood produced by mathematics" and "unhealthy mood responses" such as "being panicky and losing one's head, depressed and helpless, nervous and fearful"(p. 12–13). This passage identifies math anxiety as passive yet highly emotional; how can such strong emotional response be construed as passive? While Desi's teachers saw her as passive, apathetic, in the way she engaged in mathematics class, in her narratives Desi told a story of internal turmoil, of "panic" and of feeling "butterflies" in her stomach.

4.1.3 Learning

Through her seventh-grade year, Desi and Ms. Marquez developed a strong relationship. Desi shifted her participation in mathematics class, from waiting until she was given help, to engaging in work and conversation with peers. Compared to her first interview, Desi in her second interview described processes of learning, not panic. To begin the interview, I asked Desi what kind of a math learner she was. She replied with three words: "slow, ughhh, and fighty." ("ughhh" was said with disgust.) In the interview as a whole, Desi most often named herself as a "slow" learner of mathematics. Desi insisted that she could learn the same amount as others, but at a slower pace:

Desi   I am the type, that I would take a minimum at least the *whole day* [emphasis], to learn something, like some sort of problem, if it is something new, and I would have to keep on reviewing and reviewing until it is finally stuck in my head.

Here Desi narrated her process of learning something new, emphasizing in the construction and content of her narrative how long this takes. She used stress in the second line to emphasize time, the feeling of how long this takes to learn something new. She contrasted this process with, "those types of math learners who I don't know how, but they like know everything." While Desi must review and review to get the math "stuck in her head," these other math learners already know everything, the "sponges" who "suck it all in."

When asked how others, and then specifically teachers, see her as a math learner, Desi replied "slow." In the first interview, Desi hinted at this distinction by emphasizing those who were fast, but Desi never described herself or others as slow. Perhaps this word comes from her experience learning: taking so long, feeling slower than others, now can be crystallized into one word—slow. However, Desi did not seem to suggest that this made her less able than others. Like another student in her class, Elijah (Lambert 2017), she both named herself as "slow" and redefined what it meant to be "slow" by separating this term from mathematical failure. Slow interrupts the binary between *get it fast* and *struggle slow* that other students expressed in interviews. Here Desi proposes that one can "get it" at a slower pace; knowing does not need to be immediate to be valid. Echoing the political relational analysis in the next section, I propose that Desi *may* have been making a political point here, resisting the binaries between fast and slow, opening up new possibilities for how time relates to learning in mathematics. While Desi never identified with the category of LD, these narratives suggest that she did experience a difference in how she learned mathematics compared to her peers, one that

is related to the speed at which she learned. I do not claim that Desi identified herself as a person with LD because of this self-characterization as "slow," simply that she named herself as having differences from others in the way that she learned mathematics.

Desi narrated these differences in attention, learning, and emotion through embodiment, attending to how it feels to learn mathematics in her bodymind. Learning is narrated through bodily movement, as she grabbed concepts from the air to indicate how others learned, and emphasized how it felt to learn "slow." While she appeared to her teachers as "apathetic" when she did not move or engage in mathematics, her interviews reveal narratives of intense internal experience, the disengagement of "zooming" while sitting perfectly still, the "panic" of taking tests.

4.2 Special education and labeling in math class from a political/relational perspective

Disability is produced in contexts that are both political and interpersonal (Kafer 2013). In this section, I will share narratives in which Desi explored a political and relational analysis.

4.2.1 Special education

In her final interview of seventh grade, Desi repeatedly discussed the importance of effort, which her teacher, Ms. Marquez, had stressed throughout the year. According to Desi, it did not matter if a person has a disability, if they "put in the effort" they can succeed. In the following narrative, Desi described to me how one of her friends did not know the importance of effort. She structured her narrative as a hypothetical conversation;

Desi   It's like they feel like, you have to be able to be this or that, and even if you have a disability like, cause, I have ADHD or something, some people say, that they are amazed at the fact that I can actually learn and pay attention and try to pay attention when it is, like, hard for me.

Desi presented voices of anonymous individuals who ignore the role of effort, instead seeing success in mathematics as innate: "you have to be able to be this or that." In the middle of the narrative she used ADHD as an example. These unnamed individuals seemed to be surprised that Desi can achieve in school. Desi suggested that these unnamed critics believe that ability is fixed and that those who have a disability are incapable of learning. She strongly disagreed, and in the next narrative she expanded on this theme, again emphasizing the role of effort.

Desi   And then many people are always just like, has to do with abilities that you have and it has to do with the fact that you have to be like, if you are not good at this you are not good at it, and if you are not good at it at all then you have to be like in special ed or something and I am like, no, that's a lie. You can do it, it's just that you are not putting in the effort.

Desi referred to a narrow conception of mathematical ability: either you are "good at it" or not. She suggested that some believe that mathematical ability is static, creating a binary between those who are good, and those "in special ed." For Desi, separation into special education is tied to the notion of innate ability in mathematics. Both times that Desi used formal disability discourse in this narrative she added, "or something,"("ADHD or something" and "special ed or something"), suggesting distance from medical terms for disability. Desi critiqued the theory of innate ability in mathematics, taking up an alternative voice from her classroom teacher—effort alone determines academic success. Desi appears to take issue not with the naming of disability, but the use of such categories to separate learners in categories of capable and not.

These narratives attest to the relational construction of disability. Desi never posited that ADHD does not exist, she questioned the low expectations and segregation that accompanied labels. She critiqued not disability, but institutional structures that seek to separate out those with disabilities from the rest of the students. For Desi, these arguments are deeply relational, as she told them through stories of an argument with a friend, animated by voices from multiple points of view. This politics of disability is embodied, lived, felt through relationships.

5 Discussion

In this paper, I explored the disconnect between bodies and the social in mathematics education through work in DS, an academic field which has undergone significant theoretical shifts around how the body relates to social oppression. Recent theorizing in DS allows analysis of how embodiment and political structures are interrelated and reciprocal, allowing simultaneous analysis of the political and the embodied. Using narratives of Desi, I explored how Desi theorized how disability in mathematics is embodied, as well as how binaries limit potential for those with disabilities in schools. Her narratives call attention to how math class feels, and the political and relational implications of those feelings.

Neither a medical model nor a social model would fully explain Desi's complex set of assertions about her experience in mathematics. Desi claimed a disability identity, ADHD, and named herself as a person who "zooms" during math class. She critiqued assumptions that she (or her friends) could not do the math because they are in special education. Desi explores how stereotypes about the potential of those with disabilities lead to segregation of those in special education, either "good at it" or "should be in special education."

Desi's theorizing lends credence to complex embodiment and the political/relational model of disability. Kafer argues that disability is produced in interaction, through a binary of ability versus disability. Desi critiqued this binary explicitly, naming the binary as either you are "good at it" or "you should be in special ed." This political theorizing is not done in the abstract, but in and through relationships. Her narratives are both political and relational, born in and through relationships of power with teachers and peers.

For Siebers, "disability is a social location, complexly embodied" (2008, p. 9). Desi described two fundamental challenges to learning math: paying attention and remembering. Paying attention related to ADHD, to being a "zoomer" as she called it. Remembering is connected to anxiety, "panic" or "blanking out," as well as coming to know herself as "slow." So where is the disability that is slowness? Is it internal? Is it a processing issue, like much of the research on LD would suggest? Is it difficulties in attention as ADHD would suggest? And then where is disability located? It is produced through the context and practices of the classroom, particularly a focus on speed, but also felt through engagement in the practices of math class, like memorization. Unlike some of her classmates, Desi did not deconstruct these narratives about speed. She never questioned the importance of speed in mathematics, even as this emphasis appears to label her as both ADHD (because of difficulty paying attention), and LD (because of her difficulty remembering without tremendous effort and time). I wonder if Desi had been exposed to different practices in mathematics, such as more sustained problem-solving, if she might have developed an additional critique of memorization.

Instead, Desi took up a narrative of slow, which appeared to create space between the binary of *fast/struggle*. This reclaiming of the word "slow" I identify in Desi mirrors a wider shift that reclaims slowness in relation to speed (e.g. the "slow food" movement). When I asked students in this study why they had an IEP, multiple students told me that they had an IEP for "time and a half," a phrase that refers to an accommodation, the extra time some students with IEPs are given for test-taking. They did not name their disability using a diagnosis, but with an accommodation related to time, marking their difference using relational and temporal concepts. For students in this classroom, and many more like it (e.g. Bibby 2009), time maps onto ability in mathematics, where speed is valued above all. Insisting on "slow" as a possibility for a kind of math learner, one that is not lesser, just different, could

be a way to resist the anxiety of mathematical memorization. Slow opens a necessary space between those who get it immediately, and those who do not. Like "I don't test well," slow preserves competence, while also insisting on a reframing of the normative conditions of schooling. When we pay attention to the body in mathematics, providing what Siebers and Kafer describe as a "realistic" portrait of disability, we can see avenues of political resistance, of student agency. We can also see where we can imagine new possibilities of mathematical competence for students, democratizing time, and reclaiming slow.

6 Implications

This special issue seeks to explore material dimensions of teaching and learning mathematics, paying special attention to how the human body intersects with social and political practices. Desi's narratives in combination with the theories of Siebers (2008) and Kafer (2013) suggest several possible ways to move our collective inquiry further. While research in identity in mathematics education around gender and/or race prioritizes narrative (Solomon 2012; Martin 2009), in research on embodiment, the body is mostly observed. While multiple methods will elucidate aspects of embodiment, I see narrative as particularly relevant to understanding complex embodiment, or how embodied experience is represented through cultural representations. As Desi demonstrates, narratives can be rich sites for material and political analysis, particularly in combination with ethnographic data or video analysis. While Desi's sixth-grade teachers describe her using the term "apathy," her narratives tell a story about intense feelings. While Desi does not perform anxiety by pounding on the table, or raising her voice, she narrates the experience of not knowing as intense, as "panic", "butterflies" and "hate." This difference between observed behavior and narratives suggests both may contribute to understanding of emotion in mathematics.

While embodiment has hitherto focused on sensory impairments, the disabilities at play in Desi's narratives could also be analyzed from an embodied perspective. Too often, differences such as ADHD, LD, and math anxiety are either presented from a medical model or analyzed as purely socially produced through classrooms and curriculum. Little scholarship exists outside of that binary, taking experience and embodiment seriously while also analyzing the social contexts in which these differences in bodyminds seem to matter. As Sieber writes, "the disabled body pushes back"(2008, p. 2), providing complex understandings of lived disability, and disallowing theoretical dichotomy between the social worlds and bodyminds.

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