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Emergent Student Practices: Unintended Consequences in a Dialogic, Collaborative Classroom

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Abstract: It's a commonplace to decry the folly of "best practices" in education. They make many practitioners and researchers twitch, fearing that the good-- or even just decent--practice will soon be setting the tempo in the steady march toward standardization. The argument against best practices, then, is the argument against one-size-fits-all pedagogy. Instructional practices must come with a necessary humility, based on situating students within the picture, with particular attention to with histories of institutional and societal othering and marginalization. Good practices cannot be delivered or imposed, and therefore, if successful, they become suggestions or starting points carried out with greater and lesser "fidelity," and informed by the cultures of school, teacher, and students. This study of a middle school science classroom in a racially and economically diverse urban charter school looks at how the laudable practices of dialogic, inquiry-based STEM instruction and the concomitant agenda of collaboration and inclusion were exceeded and transformed by students in moment-to-moment interactions. The focal students engaged in talk that carried them beyond disciplinary boundaries to explore stereotypes and create new narratives around racial identities, all while asserting their own positions within the power dynamics of the classroom and small group. As activity systems analysis and narrative discourse analysis revealed, the larger classroom culture permitted this kind of extra-disciplinary knowledge construction; the teacher's practices gave rise to the emergence of alternative, student-made practices, resulting in unintended consequences that remained largely unmonitored and unsung. We have much to learn from such creative and engaged acts as examples of student work that constitute a worthy academic discourse, a deviation from the imagined best path to a different route that was unpredicted by the teacher, and only owned in the moment by students, as makers and users, and primary practitioners.

The notion of a "best practice" is kind of a set-up in any field, but especially in education. Declaring that we know the best way of working of students is not like saying we know how to make the best coconut cake; there isn't a recipe. To suggest that we can duplicate success, neatly, again and again when working in dynamic contexts, with real people in all of their variety, exposes the tendency of best practices to bend toward standardization. And, as a reminder, the recoil from standardization on the part of teachers and students is not rooted in a desire to avoid measurement; rather, it emerges from lived cultural, historic, and biographical differences. The argument against best practices, then, is the argument against one-size-fits-all pedagogy.

What about instructional approaches that attempt to disrupt the drive toward conformity? Progressive practices that promote flexibility over rigidity, human over machine, and creativity over control seem to admit their lumpiness, allowing for a plurality in how students are able to engage in learning. The classroom in this study advocated for just such practices, forming a dual track of a teacher's interpretation of best practices. First, the teacher emphasized inquiry-based dialogic instruction as best practices in STEM (science, technology, engineering, and math) education. Dialogism enlists student *talk* as key to learning, exploring, and developing understandings, rather than student *recitation* of already-known facts and concepts for a teacher's evaluation. Student talk, in this way, is interactive and inherently unpredictable. At its most expansive, it can change or alter the direction of curriculum, contribute to new knowledge, and create occasions for new enactments of self. Second, and arguably more central to her teaching practices, were this teacher's efforts to create and maintain a classroom culture that consistently reflected the linked values of collaboration, inclusion, and kindness.

In the spirit of dialogue, however, we must also consider that even the most seemingly non-constraining teacher practices contain the likelihood of co-emergent student practices. We would do well to pay attention to these, while acknowledging that they may be inconvenient, may cause a breakdown in the imagined lesson, and may veer away from the teacher's desired aim. This unruliness is difficult in practical terms, since any variability in outcomes becomes noteworthy in a system where all, in the end, are ranked. This study endeavors to hold that uneasiness at bay, asking to what extent the practices of dialogic instruction and collaboration allowed for not only different routes, but also different destinations, bearing in mind the risk in entertaining this idea with our serious societal inequities both within and without schools. Put differently, what can be learned from a commitment to freedom for student talk?

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The middle school students in this STEM classroom *did* actually talk to each other in working groups, and the talk appeared to be, in fact, related to their curriculum. Focusing on one of these groups afforded an opportunity to see how they interpreted and carried out the practices of the classroom in unpredictable and also seemingly powerful—or at least powerfully engaging—ways.

In particular, one focal student stood out in this group, for her energy in shaping and transforming their discussion. Those who have spent time in classrooms may have known students like Louisa[i]. She could be placed in a number of social categories. She was a "proud Latina" (her words). She was also a student with a history of infractions for disruptive behavior stretching from early elementary school up through this, her 8th grade year, and falling into the category of disorderly and disordered, a problem, occupying a combined position of "vagrant" and low academic performer, as linked in Richardson's (2016) conceptual history of Special Education and vocational education tracking. Louisa did school in the way that she wanted to do it, which was often selectively, and probably protectively, participating only when it seemed worthwhile. She sometimes seemed to spend more time wandering the hallways than sitting in class. Her academic output was minimal if one were to look only at completed assignments; however, Louisa was clearly an adept talker and connector, was quick to understand concepts, and had the ability to move a group through sheer force and charisma. Specific to the best practices of dialogic inquiry and collaboration, Louisa commandeered and appeared to reroute her class/group, driving the group's shared vehicle bumpily through the disciplinary terrain of science, sometimes allowing other group members to steer, and taking a fair amount of navigational direction from another student in her group, Bea, who might be pictured (in this metaphor) riding shotgun next to her. I argue that Louisa—who in other classrooms performed a well-worn practice of resistance to school activities and work—found an opening into science literacy through exceeding and transcending the teacher's instructional practices of talking-to-learn and collaboration, resulting in unintended and uninvited consequences.

Context of Standardization

As suggested above, progressive practices such as the ones in this classroom don't necessarily mesh with the demand for a demonstration of accomplishment via state science tests, and sometimes don't even lead to "success" on local, classroom-based formal summative assessments. External pressures on these "next generation" middle school STEM students included familiarity with key concepts and facts in engineering, space, earth, physical, and

life sciences, plus skills within these disciplines such as developing and using models, and designing solutions to problems.

Lawmakers and grant-givers are anxious to create enough STEM graduates to fill 21st century jobs, and a great deal of attention and funding goes toward the development of STEM programs in high poverty schools (e.g. United States Department of Education website) in order to "help" (Baker, 2017, p. 10) historically marginalized students who are continually constructed as lagging behind the proficient—usually middle-class and white—STEM student. Students, schools, and entire districts may be tagged for subpar performances on state tests. "Next generation" science standards inform these state science tests, given to eighth graders to measure their mastery of these concepts. The school-wide results of these are published in the newspaper as data about the school, presumably to highlight the quality of the programming and instruction but also to shame the failing schools, further cementing a narrative about the brokenness of public education. Despite widespread fatigue with standardized tests as biased and narrow, their continued stranglehold on schools puts pressure on students and teachers to deliver high levels of proficiency so as not to appear "less than" students and teachers at some other school, across town. The charter middle school in this study came out of their 2014 state tests with unimpressive science data; only 21% of the eighth graders were "proficient" in science, while lopsidedly, over 90% of the students were proficient in literacy. However, students performed in ways consistent with the STEM teacher's objectives, doing work that was dialogic, inquiring, and collaborative. Given their struggle to demonstrate a grasp of the conceptual material they were tested on, are we to conclude that the best practices of student-centered dialogic inquiry were flawed?

Low or spotty achievement on these measures is not unique to this particular urban charter school. It could be attributable to any number of variables unrelated to classroom practices, such as learning differences, poor attendance, histories of raced and classed educational marginalization and mobility in family structure and housing, or the tests themselves, designed for white middle class students (e.g. Moore, 2005). Further, the fruits of dialogic instruction—student talk and thought—inherently resist becoming quantitative data. For this reason, it is worth trying to understand the activity of this class specifically, to learn something about what Louisa and her group accomplished and why it might be exactly what was needed for their academic development, a disciplinary literacy that was particular to these students, at a moment in time. It's true that this moment in time might offer a slim view of these best practices in action, or, a problematically synchronic rather than diachronic sequence of a concept (Richardson, 2016), but such a glimpse reminds us that students who don't figure in the landscape of big data and might not register as performing even within the

local context of the school may still be vivid social actors who *do* contribute to schools, and who *do* participate in learning, working to change themselves and others.

Frameworks: Sociocultural Theory, Inquiry, and Dialogism

The broad framework for this study is sociocultural theory, with knowledge viewed as socially situated and co-constructed by the participants (Vygotsky, 1978). Students and teachers act and interact within classrooms, which are "cultural, institutional, and historical situations" (Wertsch, 1995, p. 11); in other words, contexts—both local and larger—are deeply connected to learning.

Within the classroom context, participants act, interact, and talk to accomplish a variety of goals, including the development of disciplinary and conceptual knowledge. Students and teachers construct knowledge and, simultaneously, identities of themselves as "scientists," "good students," or "good teachers" (or other) by using language to talk their way into the role; which is to say that science, for example, is learned through using the language or discourse of science (Kelly, 2008; Moje, 2008). This language is more than a collection of concepts and words from the STEM fields; it is a culture, entrance to which requires "curiosity, imagination, and passion" (Moje, 2015, p. 255). So it is that participation in the discipline does not occur by simply parroting certain vocabulary words. As students talk to one another, they endeavor to revoice or reaccent school discourses alongside their everyday ones from home or popular culture (Maybin, 2008; Kamberelis, 1992, 2001). Language and the conventions of social groups construct reality and signify a coherent and recognizable meaning. Furthermore, because disciplinary literacy practices are legitimated by multiple and shifting power-holders (Van Leeuwen, 2007)—from scientists, to testing companies, to teachers and students—the discourses of science are multiple and variable. Important to this study, the discourses of popular culture might have equal standing with academic discourse, and there is an inherent evaluative quality to this revoicing and "orchestration." As speakers repurpose and reshape language they are making decisions about what is good and what should possibly be remade (Maybin, 2008, p. 85).

Finally, to truly engage in discursive practices, learners must wrestle with the language, to use it vigorously and dialogically (Bakhtin, 1981). Dialogic speech is multi-voiced; it involves a back-and-forth movement between (speakers), requiring "tension, even conflict . . . as one voice 'refracts' another. . .

[It is the] struggle among competing voices--that for Bakhtin gives shape to all discourse and hence lies at the heart of understanding as a dynamic sociocognitive event" (Nystrand, 1997, p. 8). Dialogic speech in classrooms is associated with learning gains, in contrast to the authoritarian and monologic speech found in lectures, recitation, and the familiar initiation-response-evaluation (I-R-E) pattern (Nystrand, 1997). However, dialogic moments are less prevalent in schools with marginalized populations; dialogic practices take some getting used to for students, and for teachers, who must be willingly decentered at points in order to allow for the construction of new knowledge (Juzwik, Borsheim-Black, Caughlan, & Heintz, 2013). Finally, it is worth noticing that classroom interactions, dialogic or otherwise, are always complicated by sometimes tension-filled bids for power and social positioning, between teachers and students, and among individual students and groups of students (Bakhtin, 1981; Lewis, 1997; Wortham, 2011).

Classroom Activity Systems and Discourse Analysis

The study used cultural-historical activity theory (Engestrom, 1999; Yamagata-Lynch, 2010) to examine how participants acted as subjects and community members working toward common and personal objects. The object, sometimes referred to as "problem space" (Lewis & Scharber, 2014) of an activity system, was understood to be shifting and dynamic, depending on how the norms of the classroom were established and upheld, how tools helped participants mediate the work, how the labor was divided among participants, tensions between these elements, and how power moved within the system. Activity theory helped point out dissonance and resonance across systems, from smaller groups within a classroom, to the full class, the entire school, and beyond, linking a micro-culture to the macro-culture surrounding, informing, and arguing with it.

Following several methods of analysis from the tradition of discourse studies to think about how dialogue in classroom interactions *does* something and is an action in itself, Gee's (2011) d/Discourse tool offered a way of talking about and uncovering the discursive practices of the teacher and the whole class; Van Leeuwen's (2007) notion of legitimation highlighted how certain discourses and practices were championed and others were discouraged. An analysis of small group transcripts using the narrative discourse analysis methods of storytelling and narrative event (Wortham, 2011) foregrounded the ways that participants assumed different voices and personae for social positioning and promoting their ideas.

Data for the study came from ethnographic field notes taken over several months (January through June), audio recordings of small and large group interactions, and recordings of teacher interviews. My role was that of a participant-observer, leaning more toward observer in this space of student-centered practices. Transcription conventions emphasized the rapid and overlapping talk of this particular small group (see Appendix A).

The Classroom

This study took place in a racially, culturally, and economically diverse urban charter school with a social justice mission. Noteworthy aspects of the school included the fact that it was "girl-focused," with philosophical and practical grounding in feminism and principles of critical literacy. In efforts to address the gender gap in STEM fields, the school's promotional materials also emphasized their inquiry-based STEM programming. While the school was racially and economically diverse, the teaching staff, not surprisingly, was mostly white. The teacher in this study, "Ms. Amy," was also white.

For the purposes of this discussion, the science classroom within the school was considered as an activity system, within which numerous smaller systems nested. Ms. Amy functioned as a decentered master of ceremonies. Her strong presence suggested paternalistic authority, but her practices consistently marked a desire for students to own some or even all of the control while she maintained her vision of order. Ms. Amy drove interactional norms and pushed for a common object—the production of science talk and work. She was direct and warm with students; her interactions were infused with a kind of genuine "real talk" alongside academic discourse, and her tone was informal and pleasant. With almost ten years of teaching experience at the school, Ms. Amy was well loved and respected, and was often mentioned as a favorite teacher of graduating eighth graders.

The mood in her room was lively. Groups of three and four students sat together at tables, contributing to a fairly high volume of voices. For the most part, despite the noise, a calm, orderly feeling prevailed. Ms. Amy constantly reminded students what behavior was expected of them. Students were to work together, to talk, and to not leave anyone out. To help create the norm of inclusion, she instructed students in how to communicate with bodies and eye contact, telling one new student to turn her knees toward the other students at the table as a "sign of respect." Politeness was valued in this setting, so much so that

even when two students were arguing with each other they parted ways huffily with "Have a nice day" and "Thank you. You, too."

Enforcing Norms for Inquiry-based Learning Practices

Following a popular trend in schooling, and in recognition of the discursive formation of identities, Ms. Amy referred to her students as "scholars." For virtually all STEM projects, the scholars recorded their work in notebooks. These substantial hardcover notebooks were carefully stored in the classroom, forming a longitudinal record of work stretching from grade seven to eight, and serving as one of the key texts for the class. The notebooks contained technical drawings, lab notes and write-ups, observations, and even reflective and creative writing. Other resources included handouts that students read out loud to each other, miscellaneous websites, and books from the classroom. Students did not get information from lectures or from conventional textbooks. When reading aloud, it was evident that the scholars' reading levels were varied, and I wondered how well they truly took in information from listening to each other, since they didn't always noticeably follow along in order to "get" something from the reading.

Ms. Amy firmly upheld the norms of best practice for inquiry-based science instruction in the class through direct rationalization of the approach, telling the scholars that there was "power" in "taking responsibility for their own learning." She often put the justification for inquiry-based science education into everyday language for her students:

> Okay, I'm going to hand the class back over to you. You have the brainpower to do, this. (1.0) I'm gonna let you work for five minutes. It's okay if you get stuck, but you need to make sure you have a question for me when we come back together.

The scholars knew that they were not to say: "I don't get it"; they were to persevere for long enough to know what they didn't get in order to formulate a specific question for her. Additionally, Ms. Amy used her position within the institution to make sure that the inquiry model was faithfully followed. She noted that she was "particular" about not letting educational assistants answer questions from the scholars. They were only allowed to ask more questions of the students. Asserting her authority further, she mentioned that she had upon occasion "brought in their bosses" to reprimand them for getting in the way of this learning process. Ms. Amy's personal authority (Van Leeuwen, 2007) within the larger school community was at least partly maintained because of her relationships with students, and their related willingness to perform school legibly in her classroom. Because of this success, the effectiveness of the inquiry-based instructional model

wasn't questioned, although she herself acknowledged that science test scores were problematic.

Primacy of Norms for Collaboration and Kindness

Far more than the practice and coaxing of STEM literacy, the overwhelming religion of the class was the value of collaboration. Collaboration was foregrounded as the object for many, if not most, activities, and Ms. Amy could be heard intoning: "Collaboration is how people learn best" whenever she sensed a lull in productivity, signaled by talk. Not only did she ask students to collaborate, she asked for their reflections about the collaborative process: "How did you do? How did your tablemates do? What got in your way?" Students and teacher did not engage in much whole-class conversation; talk was mostly at the table level. When a group was silent, Ms. Amy worked to get the scholars talking, using an icebreaking strategy when a new student caused the conversation to come to a standstill at one table. She asked, for example: "What's the funniest place you've ever farted?" They were silent but smiled awkwardly. Ms. Amy continued: "I farted in yoga class. Just let one go." The group remained silent but allowed a few smiles, and she threatened to come back and demand that they each answer this question if they weren't talking to each other the next time she checked on them. And, in fact, they did start talking. This attention to welcoming new students was especially powerful for those who had been expelled from or bullied at their previous schools, the most common reasons given for students arriving mid-year. Ms. Amy told me that she was acutely aware of the past schooling struggles, as well as the home lives of her students. For this reason, she placed value on helping her scholars learn to be vulnerable with each other; she invited them to "not know" something, to be in doubt, and to depend upon their tablemates for help.

Ms. Amy exerted her power the most in developing an ethos of inclusion and a stance of kindness between students. She described her grouping as "intentional," and hoped that small group work would support, first and foremost, an outcome of social harmony. She wanted her students to work on their "people abilities," as much as their "scholar abilities." In setting up the table groups, then, she said: "I make sure that each group has what I call a sweetie, and also what I think of as a student that loves life. [The group make-up] isn't really about their academic abilities, but their personal traits." Indeed, Ms. Amy had enough personal authority to dictate the direction a scholar's knees should point. She also used moral evaluation (Van Leeuwen, 2007) to legitimate the norms of kindness

and care for others in her classroom, as with this conversation with two students after class:

> You know I have a soft spot for both of you. I'm worried about Rae and whether she feels included. I noticed that her face didn't look happy and I think because you are close to each other she maybe felt like an outsider . . . Let's come up with a plan for tomorrow to make this better.

In this interaction Ms. Amy marked as important the expression on another student's face, and shared her interpretation of this noticing with students, including them in the problem. Turning the observation into a moral evaluation, she registered the restoration of happiness and inclusion as a highly valued social good, worthy of advance planning to correct something that was wrong in the world of the class.

Perhaps because of the concern she showed for her students, resistance to Ms. Amy's program was not obvious on the surface. Her take on it was that there was enough institutional memory within the student population to share that she would be relentless on certain behavioral norms; making resistance futile under her "benevolent" but firm authority (Richardson, 2016). Resistance, if it occurred, sometimes took the form of a work slow-down, which may not have been intentional at all, but the result of many missed classes, fatigue, or simply confusion. However, an intriguing alternate form of resistance was observed in the case of Louisa's small group, who followed Ms. Amy's program and then warped it to meet their own interests, needs, and areas of expertise.

Small Group Interaction: The Case of Mistaken Identity

As has hopefully been made clear, the activity system of the whole class strongly supported a notion of learning that was socially and discursively constructed, inquiry-based, and dialogic. I turn now to a small group interaction to see if and how this was accomplished at a micro-level. The focal small group for this study contained four eighth-grade students, and since their racial identities played a role in the dynamics of the interaction I will include that information here. Louisa, already introduced as a Latina student with a history of resistant, often disruptive, behavior, was joined by Inez and Moira, who self-identified as racially and ethnically mixed Latina and white, and Bea, who identified herself as white. This transcript shows less than two minutes of a 45-minute conversation in which the group was trying to decide on a science fair project for the last quarter of the year. The topic for the project was wide open, and at the time of this

discussion, the class had already spent several days looking at examples of science projects in books and websites. This group joined forces due to a common interest in crime or forensic science, and they intended to select one of several possible ideas from a list they had previously generated. None of the students in this group were close friends, but because of this school's somewhat intimate setting as a small public charter, and because of the fact that it was not the beginning of the school, but the third quarter, and because of Ms. Amy's norms around collaboration, these students were continually asked to come into contact with their social others and they appeared willing and able to stay in a taut, and extended, conversation together: three Latina students in vastly different social positions, including a tall, hand-waving leader given to theatrical, larger-than-life bursts, along with/together with a diminutive white girl with choppy, dyed blue hair and a deadpan delivery.

Thinking about the small group discussion as an activity system, and given her vocal agenda, Louisa may be considered the group's primary social actor, with the other group members as both subjects and community members. Louisa's position within the system came through as she pitched a possible topic to the rest of the small group: the Case of Mistaken Identity. This science project explored how witnesses see and remember criminal activity, so it got at questions of how truth is constructed and how to assess the accuracy of solving crimes.

The interaction was a bit complicated, and Wortham's (2001) articulation of narrative discourse offered a helpful structure for analysis. Wortham (2001) made a distinction between talk among participants—an overarching context referred to as the "storytelling" event—and talk in which participants enter into a separate tale, often dramatically enacted, referred to as the "narrated" event. In this study, the storytelling event was the classroom work and talk between the four students (Louisa, Inez, Moira, and Bea), whereas the narrated event occurred when Louisa turned from the classroom talk into a different, almost make-believe, zone. Wortham's language is a bit counter-intuitive here, because storytelling conjures a "once upon a time" separation from the everyday, but his conceptualizing of the frame-within-a-frame offers a useful tool for analyzing Louisa's embodiment of several different characters.

Louisa's performance of the narrated event was part of an effort to drum up interest in her project. As part of her pitch, she voiced the roles of a detective and witnesses in an imagined crime scene. To sell her idea, she demonstrated a flair for performance and a familiarity with the discourse of crime shows. She insisted that if her tablemates used their imaginations (line 13) they would be transported into the story, and, once inside it, they would work together to do the things that detectives do: find witnesses. While she didn't actually come to the

point about the "mistaken identity" in this transcript, it was made clear that witnesses are not reliable.

8	**L**	We - are - detectives, and
9		we're at a crime scene, and
10		w =
11	**M**	We're not detectives!
12	**L**	Be quiet, yes we are--
	L, I	@@@
13	**L**	just use your imagination.
14		I still - it's still
15	**I**	Imaaaginaytion [singing]
16	**L**	Okay, Whatever (3.0)
17		So we're at a crime scene finding witnesses
18		and I say. He says:
19		[lower voice] "Okay, well the tall dude,
20		[confidential tone] well the guy that I seen was tall,
21		with dreads,
22		a big old nose.
23		He was black." (1.0)
24	**B**	[breaking out of the story] Why'd he gotta be black?
25	**L**	That's what I seen on Homicide [pronounces "home"] Detective,
26		that's what I seen on The First 48.

27 [rising pitch] They always use a black guy!

28 (1.0) Fine, we'll do a little short Mexican guy.

29 "So, there was a little short Mexican guy . . . and"

30 **B** Why can't the color be white? (2.0)

31 **L** Cuz you're white,

32 and I don't wanna offend you.

33 **B** It won't offend me

A few things stood out in this section. First, Louisa was very dramatic even when she was not in character, speaking as herself in the external storytelling frame. She pressed heavily on stressed words, and paused for effect at times (line 8, line 16). She was also dramatic in the narrated event, becoming a detective, and then quickly becoming a bumbling witness. The drama was an effort to encourage her group members to join her inside the story ("we" are detectives). Second, she appeared to be working very hard to get Bea, in particular, to accept her plan, since she took in Bea's criticism (line 24) and made changes to her pitch on the fly. By line 31, Louisa completely stepped out of the imagined crime scene and became less animated as she explained that she didn't want to offend Bea by making the criminal a white person. Louisa may have thrown herself into this presentation because she could establish herself as someone with expert knowledge of crime shows. She may have been especially drawn to the concept of mistaken identity, beyond the crime show connection. On the other hand, Louisa may have been motivated by her interactions with Bea, either wanting to please her, or wanting to test how touchy Bea was, wondering about the extent of her white fragility. I suspect that Louisa was motivated because she found in Bea a worthy opponent, perhaps more than anything, someone who could counter-balance her own force.

Bea's complaints in this interaction were also interesting. She questioned Louisa's imagining that anyone but a white person committed the crime, and, while she didn't say much about what was implied by this pattern, she didn't let Louisa rest. The tone of the interaction was very excited at times, but the tension between Louisa and Bea was generative because it resulted in modifications to the story that were less stereotypical; the playful quality was evident from Louisa's cheerful willingness to completely change the narrated event when pressed by

Bea. Louisa and Bea engaged in a kind of combative play that fueled the dialogic construction of the crime scene, and sustained and deepened the conversation more than if Louisa were just stating what might happen in the Case of Mistaken Identity.

Continuing on with this interaction, once free to identify a white person as the perpetrator, Inez suddenly entered the conversation more forcefully. She framed Bea for the crime, thus joining Louisa inside the narrated event and bringing Bea along as a character. Louisa insisted on crime show discourse being upheld (line 37), but by line 46 Inez rejected the narrated event in favor of reconstructing the story in a way that would help it fit the discursive scientific practices necessary for the class assignment, pointing to another source of productive tension in this interaction, this time between Inez and Louisa. In this section Inez revoiced herself and her group members as "good students." She moved from making side comments, such as repeating Louisa's word in song—"imagination" (line 15)—to speaking quite earnestly and persistently in efforts to make Louisa's idea more legible and school-worthy, experimenting four times with the way it might sound legitimately like scientific discourse (lines 46, 50, 54, and 59). In addition to constructing an unfinished bridge between everyday talk and academic writing, Inez also made it clear that she wasn't sure what the "learning" would be (lines 48, 50, 54). Trailing off her statements, it was as if she wanted someone to bring it home for her, to dictate while she wrote. When Louisa affirmed the learning that Inez suggested (line 60), finally granting some closure on an indefinitely suspended idea, Bea offered a final rejection of the proposal (line 61) on the grounds of boredom, which yanked Louisa back into the storytelling frame so she could tell Bea to die.

34	**I**	Okay, so it was Bea (1.0)
35	**B**	So, the killer looked like Bea
36	**L**	Stopstopstop [rushed together]
37		They don't <u>know</u> who Bea is
38	**B**	The killer looked like this [points to herself]
39	**L**	Be quiet be quiet
40		"So, I was walking out the store and I seen a <u>girl</u>,
41		or a <u>lady</u>

42		or whatever the hell she is.
43		She's like" (1.0)
44	**M**	[a teenager, probably,
45	**L**	[She had,
46	**I**	So basically what you're getting at is like
47	**L**	"She had white, baggy clothes,"
48	**I**	[writing] that we're learning, that the =
49	**L**	"She looks like this girl I used to go to school with—"
50	**I**	So we're learning like how to identify people,
51		like how you're gonna identify people
52	**M**	and you say something about somebody,
53		like "they had a cap on, a red cap on"
54	**I**	yeah, [so that's what you're learning
55	**M**	[like based on
--	--	----
59	**I**	You're learning how to identify people in a murder case
60	**L**	Yeah, with just a little description
61	**B**	It sounds boring.
62	**L**	Go die in a hole.
63	**I**	All right--
64	**L**	I'll help you build a hole,
65		you want me to? @@

66 **B** @@@ you don't build a hole, you dig a hole

67 **L** The hole we're gonna build?

68 You can dig it.

B @

Louisa placed the narrated event in the future by saying that the criminal looked like someone she "used" to go to school with (line 49). Earlier, the witnesses describing the crime occupied an indeterminate time and place. Now the crime was projected into a future in which Louisa was herself a witness, somehow looking back on her middle school years with Bea and evoking a memory of her based on that time. Maintaining her focus on the witness statements and demonstrating a complete lack of interest in the assignment sheet suggested that Louisa was continually positioning and repositioning herself in the narrated event in order to enjoy the pleasurable opportunity it afforded her to imagine being in a crime show, as detective or star witness, and to assert her dominance in the group as controller of the pitch.

Despite Louisa's dominance, power moved between and among participants, in talk that was both playful and combative. Louisa made multiple bids for authority—telling people to "be quiet," for example—and yet happily gave some of it up to Bea, without whom there would have been no need for exertion on Louisa's part. Bea retained power through her oppositional stance: she questioned the stereotyping, and then, she ruled it boring, although she was not doing half the work that Louisa or Inez were doing. Inez's bid for power came as a result of her labor as the writer, and her insistence on connecting the crime show with the classroom assignment. In attempting to translate Louisa's pitch into a written form, to make it recognizable as a STEM project, Inez was also oppositional. Moira was the only member of the group who did not change the course of the talk measurably, despite the fact that she initially blocked the entire concept by refusing to enter the narrated event: "We're not detectives!" (line 11). Later, Moira's contributions were supportive of Inez, primarily, as she voiced something a witness might say, and supplied some words and examples for the written part of what may have been, from Moira's perspective, a bewildering and unruly proposal.

This sustained classroom interaction, as was mentioned earlier, was part of a 45-minute discussion within the group. The kind of work that it accomplished was valued in the larger activity system because it appeared to be "on task," and it

was consistently dialogic and collaborative, even though the disciplinary talk was not of a technical nature. Inez, for example, tried doggedly four times to capture the STEM skills that would be gained or emphasized in the project. She was doing the hard work of dragging Louisa's crime show/popular culture discourse into her idea of academic discourse. If student access to science is accomplished through talking and acting in the social and symbolic worlds that make up the knowledge and practices of science as a discipline (Kelly, 2008; Moje, 2008, 2015), then Inez's eventual learning objective seemed somehow inadequate: "You're learning how to identify people in a murder case." The repetition didn't, in the end, yield scientific discourse.

Unintended Outcomes in a Collaborative, Dialogic Classroom

Aside from the outcome of sustained talk, but limited measurable STEM "learning," what can be learned from following this group's adherence to the two highly valued practices of (1) dialogic inquiry and (2) collaboration, inclusion, and demonstrations of kindness?

First, the scholars did successfully engage in dialogic talk, and this interaction showed the way such speech changed thinking—although not necessarily scientific thinking—through the reproduction of other voices or particular types of discourse (revoicing, mentioned earlier). Louisa revoiced crime shows and was challenged by Bea, the group's cultural critic, who prompted Louisa to revise her "script" (re-revoicing) in response, until "individual impressions and reactions [became] socially forged" (Maybin, 2008, p. 85). Inez spoke at a slight distance from herself as a focused student, reproducing both teacher and student voices in a dynamic dialogical process with herself, as much as with her group mates. The significance of revoicing here is enormous in that it shows an integration of other ideas and talk as well as a necessary evaluation of such, ultimately demonstrating how Louisa, Bea, Inez, and Moira take in, consider, and act in the world, to change it in word and deed.

Second, this interaction illustrated the social connection afforded by dialogic talk as these scholars sparred within their group. Again, the group successfully executed Ms. Amy's belief in collaboration as best practice, but not through something that would generally be viewed as inclusive (there was limited space for Moira's voice, for instance), and not through demonstrations of kindness. Collaboration *was* motivating for this group in their own way: through contestation and conflict. Bea didn't like Louisa's idea, but her resistance prodded Louisa into reacting by poking holes in the crime scene scenario. Argument was

valued over silence. The group, in contrast to Ms. Amy's stated goals, did not appear to have a sweetie, nor did it have someone who "loved life," necessarily. The group members did exhibit some good will toward each other, and patience with the process of constructing knowledge, both in the moment and sometime in the future (at the impending science fair). They were flexible, seen in how they took up different roles and jockeyed for power, and their ability to continue talking about the project ideas was testament to the strength of the group as grapplers and connectors. Their engagement in dialogue across differences in racial and cultural experiences and identities, as well as differences in histories of schooling, was clearly pleasurable in part because it was built from the clash, not the harmony of ideas, especially between Louisa and Bea. The obsession with any number of deeply significant (racial identity) and less significant topics (crime show protocol) seemingly unrelated to science, the lack of agreement, and the forestalling of any closure were not intended outcomes of Ms. Amy's practice; rather, they became the practice that her students created on the fly, as improvisation, and, possibly in order to sustain connection across social difference.

Implications: Allowing for the Emergence of Student Practices

In so many ways, Ms. Amy's students really accomplished the object for her class: the scholars engaged in dialogic, inquiry-based collaboration. Their pugilistic version of collaboration yielded thinking at a level that might be considered "scientific," if we embrace a definition of the discipline that is "practical, world-changing, and world-creating" (Stetsenko, 2008, p. 524), and demands "cogenerative" talk as necessary for entering and solving problems.

And yet the outcome was not measurable scientific success. Positive feelings about work in community and well held norms about collaboration and dialogic speech did not lead inexorably to high-concept scientific learning. The interaction was focused on many things that were not connected to middle school science standards, so perhaps the talk was simply too wide-ranging and interdisciplinary to help students understand scientific concepts (from a quantitative data perspective), although the group clearly engaged in the key middle school science skills of investigation, problem solving, and decision making in order to inch their way to a science fair topic (Calado et al, 2013).

However, the interactive work of this group might pay off later. It is certainly possible that students who feel pride in their work despite its non-standard quality or lack of completion will return to science sometime in the

future believing that they can do it, and in returning to science, they will eventually gain deeper scientific knowledge and skills. Learning science, and indeed any academic discourse, might require participants to use their imaginations, as Louisa urged. For students to enact the identity of scholars, whether in word or deed or both, they must leap into the conversation, which places them somewhere within a community, one (ideally) where nobody is excluded. That's what we want, but in focusing unwavering attention on collaboration and inclusion, and despite richly dialogic, inquiry-based work, the scholars ended up with a self-guided experience of debating perceptions about race and innocence, rather than scientific proficiency. Such proficiency was not important to all members of the group, especially Louisa and Bea, who co-created a shared, alternative academic discourse that made participation not only possible, but also pleasurable.

For a resistant student like Louisa, we might read this interaction as her effort to assert aspects of her own self and her own aim (Baker, 2017, p. 23), rather than participating in the narrative that over eight years of schooling had repeatedly cast her in the role of problem student. More research is needed on how to sustain imaginative engagement within and *without* a discipline, as defined by states and as permanently recorded by big data. For while there are possible benefits in the short term for teachers who hold tightly onto their disciplinary content, loosening the grip, as Ms. Amy undoubtedly did, to welcome and cultivate dialogic practices in urban settings should not be abandoned. The study illustrated that such moments have the potential to yield abundant, if uneven, academic rewards: flexibility of thought, emotional engagement with both subject matter and peers through vigorous sparring, and lived experiences of independent questioning and decision-making. The unintended consequences of the small group veering off course resulted in the emergence of their own practices, a surplus of talk that did more than the teacher supposed, exceeded what was and indeed what can ever be measured in middle school science. Here we must follow not the "fastest and cheapest line" between self and aim (Baker, 2017, p. 23), but be willing to entertain new aims if we want to include students like Louisa, who have, in a sense, been subjected to cases of mistaken identity, picked out of the line-up because they satisfied characteristics in the long-standing category of trouble. Through the benign neglect, or read differently, the trust of a teacher who tried a "best practice"—flawed as it must inevitably be—the classroom talk yielded something, instead of nothing, which is how much information big data would register about such a student, one who resisted oppressive practices and structures, but on her own terms could be and do otherwise.

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Appendix A – Transcription conventions

__(underline)	stress
-	breaks or stops
?	rising intonation
(1.0)	silences, counted to the nearest second
[	simultaneous talk, overlapping
=	interruption
[ ]	comments from researcher
@	laughter

[i] All names were changed for this article.