ASHRAF SHADY

14. THE ROLE OF CULTURAL ALIGNMENT IN PRODUCING SUCCESS IN URBAN SCIENCE EDUCATION

Abstract This chapter highlights my experience as an immigrant science teacher during the school year of 2006–2007 in a low–academically performing middle school in New York City. I experienced didactic difficulties because I lacked the cultural awareness necessary to produce positive teaching and learning environment. Accordingly, I used cogenerative dialogues to improve teaching and learning in my classroom. The results of the study indicate that because of participation in cogenerative dialogue the students and I learned the importance of shared responsibilities on acquiring new identities that supported science teaching and learning. We learned how to communicate effectively across differences that often act against success in the classroom, including social class, ethnicity, gender, and age.

THE CHALLENGES OF TEACHING IN DIVERSE URBAN SCHOOLS

According to the National Science Research Council (1996), all students should have the prospect to achieve high levels of scientific literacy, but the reality is, many urban schools do not meet this ideal. Students' performance in school is an intricate process that is structured directly or indirectly by macro structures, such as, race, ethnicity, immigration, socioeconomic status, and access to qualified and experienced teachers. Reflecting back on my experience in New York City (NYC) public schools, I discovered first-hand how the cultural and socioeconomic differences play a role in mediating the outcomes of teaching and learning in science education. The research described in this chapter, is an auto-ethnography detailing my experience as an Egyptian immigrant science teacher in an eighth grade inclusion class, in Astoria Intermediate School (all names mentioned in this chapter are pseudonyms, unless mentioned by the author) in Queens, NYC during the school year 2006–07.

The school

According to the school report card, the demographics of students in the school were 52% Hispanics, 22% Asians and Pacific Islanders, 19% African Americans (under this category also fell students of African origin, and students of African origin from the Caribbean islands, such as, Jamaicans), and 7% White. The gender breakdown was 51% males, and 49% female, which is a typical gender composition of most

K. Tobin et al., (Eds.), Transforming Urban Education, 225–244.

urban schools in NYC. The annual attendance rate for the school was about 80%, which is below the NYC public schools' average of 90%. Students' stability as of 2006 was 92%, which was below the city average of 94%. The average class size in the school was 28 students. During the school year 2006–07, the school qualified for Title I designation, because most of the students came from conditions of economic hardship. This classification provided extra funding from the federal government that was used by the school administration for after school programs, and to lower class size among other things.

My experience as a science teacher

My teaching experience in Astoria Intermediate School has been structured primarily by my experiences as a learner in the science field. I taught science in a teacher-directed approach, which did not appear problematic at first. During the first few years of my teaching, I was assigned the top classes where my students worked to meet the learning objectives set by me. I relied on extrinsic motivations, such as, giving my students grades and rewards as a process of inspiring them to complete work. Most of my students in these classes took the advanced Earth Science Regents course, and on average, they had a passing percentage of about 80%. Reflecting back on this experience, I could attribute my success to the demographics of these classes. The majority of the students in these classes were first generation Asians, Pacific Islanders, and White immigrants who learned in their homelands in a teacher-directed approach. Accordingly, my teaching practices did not appear to be out of context for them.

The class

During the school year 2006–07, the school administration felt that I could replicate the same kind of results with the other classes, so they assigned me an eighth grade inclusion class (some of the students were designated learning disabled.) The class had 14 students, which is far below the school's average of 28 students. The attendance among the students in this class did not exceed 50–70% on any given day, which is far below the school's average. The students in the class scored either level one, which is far below average, or level two, which is below average on the English Language Arts, and the Mathematics citywide tests in grade seven. The racial makeup of the class was 60% black, 33% Latinos, and 7% white. In comparison to the rest of the school, the proportion of the black and Latino students in the class was relatively high. The students in this class formed camaraderie with their peers in the class that was structured by shared experiences in the class, the school, the street, and Astoria housing project where most of the students lived.

I would describe my experience in this class as difficult; the students inscribed me as culturally "Other". They were disrespectful to me; they made fun of my accent, and even mentioned to me at one point that I must be a terrorist, since I came from the Middle East. These behavior problems exerted a heavy toll on me. I struggled to

find successful strategies for dealing with their forms of cultural enactment. I made the common mistake of reacting to my students' practices, rather than investigating the driving forces behind their responses. I counteracted their actions the only way I knew how, by instituting a zero tolerance policy. Any student who disrupted my class got a call home, followed by a referral to the dean; a policy that was sanctioned by the New York City Department of Education (NYCDOE), and rejected by the students who suffered the consequences. Needless to say, that my zero tolerance policy did not achieve the desired outcomes, the students felt that I was trying to oppress them, and consequently they rebelled. Ken Tobin (2007) notes that conventional wisdom about good teaching has focused on teachers controlling students to keep them orderly, and maintain relatively quiet classes. This myth of control over fosters cultural practices that might be interpreted by the students as disrespectful. When this occurs, struggles for power over can arise, reducing the quality of learning environments, and set the stage for teachers to be judged as ineffective. In order offset such a scenario, teachers need time and face-to-face experiences to adapt their teaching practices to the cultural capital of minority youth across boundaries of age, race, and class.

This cultural misalignment could be exacerbated by macro structures, such as, cultural diversity (Shady 2014). In my case, my lived experiences became a reference point that created an environment filled with instances where struggle for control over ensued between my students and I. As a teacher, I clung to cultural practices that were perceived by my minority students as disrespectful; such as, constantly reprimanding them for not using valid science arguments, or using the inaccurate canonical terms in making their arguments. Although my intentions were to help them make the crossover to the mainstream culture, my cultural practices led to the buildup of negative emotional energy (EE). Randall Collins (2004) contends that when social interactions lead to the development of lack of sense of group membership negative EE can accumulate. The students hated my class, and I dreaded teaching them. The learning environment in the class was dysfunctional. Furthermore, I did not have the tools to construct and maintain a productive learning environment. Like most teachers, I failed to recognize that my students spent years learning a gamut of practices for connecting to the world. These practices may have been efficient in building solidarity with their peers, but incongruent with classroom teaching and learning (for example, making jokes to get attention, or to gain status among their peers.) In any case, these transactions became a well-practiced routine, and I should have taken into account that altering such counterproductive conducts in the teaching, and learning environment would require an individual, as well as collective effort from the participating stakeholders.

FROM PRACTICE TO RESEARCH

Cogenerative dialogue and cultural misalignment

The cultural misalignment between the students in this class and I provided an opportunity for the use of cogenerative dialogue (cogen) as a tool to produce practices

and schemas that are conducive to a successful learning environment (Tobin 2014). As a teacher-researcher, through participating in cogen, I got to identify which instructional practices were conducive to productive learning environment, and which ones were not supportive of teaching, and learning in my science class.

Initially, I did not use cogen for research purposes, but with the goal of improving the learning environment. As I discussed the challenges that I encountered in the class with Ken Tobin, he suggested that since cogen was part of my usual professional development routine, I should start doing research in my classroom to ascertain if and how it was making a difference to the teaching and learning of science in my classroom. My research goals focused on developing a better understanding of teaching and learning, and using what is learned to create and sustain an enhanced learning environment. Since the research involved human subjects, the students and their parents or guardians had to give their permission to be video, and audio recorded using the standard consent, and assent forms employed by the NYCDOE. My perspective on obtaining approval for undertaking research with human subjects was guided by the Belmont report (1979), which is entitled "*Ethical Principles and Guidelines for the Protection of Human Subjects of Research", and* "the authenticity criteria" advocated by Egon Guba and Yvonna Lincoln (1989). The Belmont report addressed three general principles: respect, beneficence, and justice, and emphasized that research should respect human participants by maximizing their autonomy to make choices about their participation, that there should be a balance favoring the benefits associated with being involved in the research compared to the harms from being involved, and that research should maintain high ethical standards, especially in regard to social justice.

Selection of participants

The participating students in the cogen were chosen purposefully based on the contingent selection process advocated by Guba and Lincoln (1989) in *Fourth Generation Evaluation* to obtain diverse perspectives on teaching and learning. During the first semester, the cogen team included me as a teacher-researcher and two African American students who acted in the capacity of student-researchers, Star and Steve. The number of participants increased during the second semester. In the selection of the students, I did not use random selection; I used a process that involved the use of ontological opposites. Star is an African American female, who struggled academically in science, and the other subjects. She tended to be confrontational, and physically aggressive. Consequently, she was suspended more than once during the school year 2006–07. Having selected Star, I then selected Steve, who was as different from Star as possible. Steve is an African American male student, whose academic performance fluctuated, depending on his moods. He experienced periods of extreme emotional and physical withdrawals, where he would put his head down, and refuses to participate in class discussions. Both Star and Steve, lived in the Astoria housing project, and experienced socioeconomic hardships. The cogen team met during the

lunch periods, or after school every Monday to plan for the coming week, but we also met during the week in the same times, if we felt that there was need to meet. During cogen, I made every effort to remove any spatial configuration that tended to produce power differentials. For example, during our meetings I sat next to the Star and Steve rather than at my desk. I started my meetings by clearly stating the rules, such as, no one voice is privileged, and respect among the stakeholders should be prevalent at all times.

The research utilized the experiences, knowledge, and practices of the student-researchers to help inform and improve the learning environment. The use of students as researchers provided a way to obtain their perspectives on what was salient in terms of school, teaching, and learning, as well as innumerable other issues. Having collectively identified foci for research, the student-researchers provided insights into what was happening in the classroom and why it was happening. Their roles varied between identifying, critically discussing, and analyzing video clips that were salient to our research, and interviewing their peers.

METHODS

Tobin (2006) contends that much of the research in urban education is premised on deficit perspectives of the school system, the teachers and the students. Accordingly, to counteract the possibility of adopting such a standpoint, when I faced mounting resistance from my students I resolved to undertake auto-ethnography to learn from my own efforts to teach science in urban schools, and autobiography to explicate my understanding of my own biases. Before I learned how to be an effective teacher I had to learn how to communicate successfully with my students across social categories, such as, age, race, ethnicity, and social class. I had to understand their ways of making sense of the world. I had to demonstrate to my students that I could teach them in the ways they expected to be taught, and that I would be helpful to them, not only in science but also in dealing with life's problems, I had to convince them that "I got their back."

The research focused on studying teaching and learning of science in two fields: the science classroom and the affiliated cogen. The broad research questions were: How did participating in cogen structure the practices of stakeholders? To what extent is the culture produced in cogen enacted in the classroom and vice versa? How did participation in cogen improve cultural adaptivity among stakeholders? What roles do successful face-to-face interactions play in fostering solidarity in the classroom? How did participation in cogen improve science achievement?

Dialectical dynamics

Throughout this study, I employed a dialectical framework in which dichotomies are avoided, and relationships among social categories are theorized as constituting a whole in which constituents, such as, agency and structure presuppose one

another's existence. This standpoint was informed by the work of critical educational researchers, for example, Henry Giroux (2001), who argued that human agency and structural features should not be dealt with as a dichotomy, because that would repress either individual autonomy, or structural determinants, such as, race, ethnicity, and meritocracy that exist outside the immediate encounter of human actors. Structures mediate what individuals do, but they are not deterministic since, if actors exercise their agency, which is their ability to act, they can alter structures using them to pursue their own goals. Some practices tend to reproduce structures and other practices tend to transform them, hence as culture is produced it is simultaneously reproduced, and transformed. I also focused on the dialectical relationships that are central to my research, such as, the unfolding production of teaching|learning, practices|schema, individual|collective, and goals|motives. In this chapter, I follow the suggestion of other researchers to use the Sheffer sign "|" for producing theoretical concepts consistent with a dialectical approach, where each part presuppose the other (Roth and Lee 2004).

Data sources

Since my approach to this research was interpretive, I started my data analysis by answering two main questions, namely, what is going on here? Moreover, why is it happening? (Erickson 1986) In doing so, I was guided theoretically by Sewell's (1999) theories on culture, whereby culture is enacted as patterns that have thin coherence and associated contradictions. I drew on a variety of qualitative research methods that are appropriate to the research foci, including authentic ethnography, and conversation analysis using the conventions employed by Tobin and Llena (2014). I also, asked the participating students in the cogen group to provide daily narratives about their activities, inside and outside the classroom, to provide evidence for the existence of practices and schema from other fields, such as, home and school into the cogen sessions and vice versa. In addition to field notes, we videotaped, and audiotaped the class and cogen meetings.

The inclusion/exclusion of what is considered salient data was informed by the research theoretical expectations (Hall 2000). For example, the cogen team picked vignettes that highlighted instances where the dialectical relationships of agency|structure, and individual|collective were in existence. Accordingly, data collection was theory laden, and recursively connected to teaching and learning. A stationary camera with wide-angle view with an open audio source sat above and behind the cogen group; this technical arrangement afforded the cogen team the chance to have contextual meaning of utterances during our conversations. The choice of captured stills from video clips relied on the context in which it was taken. Such as, in instances where we felt that I taught using a teacher – directed approach the still reflected that by focusing on me without the learners. If my teaching approach represented an interactive activity with the learners, the still reflected this by including the students as well in the frame carrying on the activity. The analysis

of the video vignettes became reference points for discussion for the cogen group around salient relations, such as, students' perspectives on the curriculum as taught and the curriculum as enacted by students.

All relevant videotapes were digitized to make them available for analysis using iMovie, and QuickTime Pro. The software allowed the research team (cogen group) to slow down, or speed up the recorded frames, to capture interactions at the micro-level that might have been overlooked in real time (meso-level). The cogen group viewed the videotapes, both individually and collectively, with the intent of capturing the most salient episodes to our emerging questions. As a team, we made sense of the data collected by analyzing individually and collectively at multiple levels to understand and generalize our findings.

THE WATER FIGHT

In the following section, I investigate how cogen served as a social field where participants lived experiences was reproduced, and transformed as they were enacted in the cogen field. Like most teachers, I felt that I had to cover the materials on the New York State Science exam, so I utilized the pedagogical method of backward design that begins with the end in mind; as a teacher, I started with what understandings I wanted my students to develop. In this instance I wanted to introduce the role of variables in experimental design, which is part of the major understandings in the New York State Learning Standards. In accordance with my usual practice, I discussed the lab in advance with Star, and Steve. One of the ideas that I suggested to the group was the penny–lab. The objective of the lab was to introduce the process of isolating variables in a controlled experiment. I asked students to find out how many drops of water could a penny hold. Through data analysis, the students had the opportunity to identify variables that might influence the number of water drops. For example, the size of the dropper, the distance between the dropper and the penny, and the force applied to the dropper.

As the bell rang, signaling the beginning of the period, the students came into the room. I explained the lab and asked them to proceed. About 10 minutes into the lab, Star started splashing water into Dre's eyes (classmate); he reacted by splashing the water back into her face. Within few moments, the whole class ended up participating in a water fight. All my attempts to stop the ensuing chaos were futile, so, I just sat at my desk fuming, contemplating how my student researchers, out of all the students, could have done this to me; I decided to address the incident right after class, so, I asked Star and Steve to come for a cogen session. My intentions were clearly to address the preceding mayhem, and to make sure that this situation was not about to repeat itself. As the cogen session started, I couldn't help but approaching the situation in an indirect manner (in Egypt, it was customary in my family to tackle variances indirectly, rather than head-on.) I decided to inquire about Star, and Steve's classwork, and life in general hoping that I might find a cue of what had led them to act in this manner. I started the meeting by asking Steve about his progress

in science. At that point, I knew that he was not doing well from the work that he had been turning-in. To my surprise, Star interjected and said no, actually, he does his work, and Steve agreed with her. I was disconcerted. How could these students look at me with a straight face and tell me that everything was OK? In attempting to reflect upon what happened, I referred to the video clip. In Episode 1 and in subsequent fragments I refer to myself as Shady, which is my last name.

Episode 1

Turn	**Speaker**	**Text**
01	Shady	so Steve↓ (1.3) there are couple of things that I want to talk to you about::first of all, I noticed that after being interested in science, (1.5) lately you have been having your head down again, and not paying attention. (1.7) is there any reason behind that?
02	Steve	{2.8} h:::mm((Steve is looking at Star, and smiling))
03	Shady	((I turn my head towards Star and direct the question to her))↓have you noticed that?
04	Star	=noo↑((she looks at Steve, and smiles))
05	Shady	=the reason I am saying this
06	Star	[he do do his work↑
07	Shady	((looking at Steve)) so:: you think you′re doing better now?
08	Star	[better::I think so↑ ca:::use he usually say sure, good when he does his work
09	Shady	((Looking at Steve))=so::how are you doing in your other classes?
10	Steve	huh?↓
11	Star	=b↑etter
12	Shady	((I turn around and ask Star)) is he doing better?
13	Steve	=I don′t know
14	Star	[I think so↑

This episode is about one minute into the vignette; its effect is one in which Star managed to appropriate speech patterns, such as, pauses, and sound pitch as resources to meet her goals of getting Steve on her side. This became apparent through her interjections, with the associated higher pitch in her immediate talk (turns 4, 6, 8, 11, and 14.) As the meeting progressed, negative emotional energy

started to build up. I used interrogative speech patterns, such as, is he doing better? In turn 12, that positioned the participants on the defensive. There was a clear cultural misalignment represented in disproportionate turn taking. I spoke for longer turns than the other participants, and more often (6 turns out of 14.) About 4 minutes into the conversation, I decided to switch the topic from talking about Steve's progress to discussing Star's progress with the purpose of getting a hint into what happened during the previously mentioned penny-lab. Although, my intentions were to focus on teaching and learning, but because social fields have no boundaries, (Tobin and Roth 2007), the conversation drifted towards Star's home life. In episode 2, Star mentioned that she has been acting out as a result of being physically, and emotionally abused at home.

Episode 2

Turn	**Speaker**	**Text**
1	Shady	how about you Star? what is going on?:: you have been driving me crazy lately
		{2.3} ((Star is looking down at her hands))
2	Star	everybody↓
		{2.3} ((Star is not responding, and still looking down at her hands))
3	Shady	what's going on?↓(1.3) do you want to tell me about it?↓(1.5) are you upset at something?
4	Star	h::mm(0.9)
5	Shady	are you upset with something that I need to know about? ↓
6	Star	i was↓(1.5)
7	Shady	at me or at something else?
8	Star	[something else↓
9	Shady	[and you decided::to make me pay the price? ↓
10	Star	[nooooo:::everybody pays the price (0.9)
11	Shady	what is the matter? tell me↓(0.3)
12	Star	it is my mother:::: she went after me with a baseball bat.

In episode2, which followed episode 1 directly Star responded to my questions about her conduct in a fading voice. During this episode she managed to control the conversation by utilizing the pauses during and between turns as resources (turns 2, 4, 6, 8 and 10). I continued to speak for longer turns (1, 3, 5, 7, and 9) than Star. As the conversation continued, I began to feel weary. I promised my students that what

happens in the cogen meeting stays within the group, but at the same time, under the *Child Abuse Prevention Act* of 1985, I was a mandated reporter. I asked Star if she reported the incident to the proper personnel. She said, "no." At that point, I felt the importance of what happened in the penny-lab diminish in comparison to what she had told me. I encouraged Star to report the incidents of abuse to the guidance counselor. The guidance counselor and the principal in turn reported the incident to the proper authorities based on Star's report, and *The Children Welfare Services* investigated the situation in her home and opened a child abuse case, placed Star in a foster home where the mother was not allowed to get in touch with her while the case was being investigated.

In a subsequent meeting, I asked Star to write afterwards why she shared her home situation with me. She wrote, "I felt good about telling Mr. Shady what had happened because I felt like I can trust him. He is the only teacher I can talk to about my life and how I feel when I am in the house. When I spoke to Mr. Shady I felt good, relieved." Reflecting back on this cogen session, the initial development of negative EE in episode 1 of the meeting was the result of me trying to establish a power differential to meet my goals of reprimanding my student-researchers. The students perceived these cultural practices as disrespectful. My transactions lacked fluency (they were not timely, anticipatory or appropriate). I took on the role of a teacher whose students had failed to meet his expectations. This standpoint led to the production of power disparity, thus supporting the development of negative EE that lasted throughout the cogen. For example, during the cogen Star and Steve avoided my eye contact, and stared either at each other, or at the floor. In episode 2, the home-life became the driving force, as well as an escape route for the participating students from a cogen meeting gone badly. This vignette highlighted the social, cultural differences between Star, Steve, and me. The sociocultural background of the participants played a role in structuring the conversation, and ultimately its demise. My views of social life were positivistic in nature, where if I disagreed with my students one of us is true, and the other is erroneous; one of us is endorsed by facts, I assumed in this particular case that this one should be me. This view fostered an atmosphere where the conversation became a site for struggle.

Anthony Appiah (2006) argues that conversations across boundaries could be burdened by cultural differences. He contends that there are three kinds of disagreement about morals; one when we can fail to share a vocabulary of evaluation; another, when we can give the same vocabulary different interpretations; and when we can give the same values different weights. Each of these problems seems more likely to occur if the argument engages individuals from different cultures. Especially, when the conversation involves "thick concepts". Appiah states that thick concepts are contextualized; in order to apply a concept you need to think of the act in which word or sentence is used. For example, "disrespect" in order to understand such a concept you need to think of the act that would defy decent behavior. Thus, thick concepts are culturally constructed; with the lack of cultural alignment, these concepts might become originators to variances. One way to mediate such disagreements was to

adopt a cosmopolitan view of social life that is theorized around differences; one could assume that all cultures have enough overlap in their vocabulary of morals to begin the dialogue.

THE ROLE OF PEER DEBRIEFING

Once a week, I participated in a scheduled meeting of the larger research group coordinated by Ken Tobin at the Graduate Center of CUNY. Usually each participant in the group was involved in his or her own research, and we came together to discuss what we were learning. The purpose of these meetings was to enrich our research through the critical insight of peers. I took my vignette to the research meeting to argue for the ethical dimension of the cogen, and the role of the teacher-researcher when he or she encounters issues that require reporting. Tobin suggested that I would follow the protocol required by the New York City Department of Education (NYCDOE); in addition, I should reconsider my methodology. He stated, "from the vignette it appears that there is a cultural misalignment between you and the students in the cogen group. You came across as a teacher who is about to reprimand his students, the students sensed it, and acted, accordingly, to diffuse your anger. The students in the vignette got each other's back against you, "as it is apparent in Star's defending Steve's academic conduct." Tobin suggested that I would start with one-on-one cogen, which might be a more appropriate methodology for participants to talk over boundaries of age, race, ethnicity, and social class when they experience a large cultural gap.

RESTRUCTURING COGENERATIVE DIALOGUE: ONE-ON-ONE COGEN

In a commonly structured cogen, multiple realities, voices, and discourses conjoin and clash in the process of coming to know. The tension between being and becoming represent a far greater challenge to students who suffer a difficult socioeconomic status. These students need more fostering, and far more support. This perspective takes into account the fact that individuals are born into structures that either empower, or restrain their agency within a specific social field. Being cognizant of the fact that they are not passive actors, but tactical improvisers who respond to structures in a way that expand their opportunities to succeed. Their deeply ingrained past experiences and the restraints offered by present situations mediate their responses, therefore, constructing their sense of being in the world. As teacher/researcher, it became crucial that I connect with the different cognitive aspects of my students, such as, pain, and suffering. One way of doing this was by reconsidering the design of cogen in order to reflect the realities of the participants. I asked my cogen group for their input on adjusting the design of the cogen (teacher with two, or three students) to one-on-one cogen. The cogen team agreed with me that in most cases we do not generate the learning outcomes that could alter the culture of the classroom into a productive one, because of instances of cultural misalignment, and one-on-one cogen might be a better arrangement.

One-on-one cogen with Steve

I chose this vignette with the help of Steve and Star, because it highlights an issue that I encountered on regular basis, which is the possible role that race might play in constructing students' perception of what is considered to be a good teacher. On the day of this recording, Steve did not show up to the class contrary to his usual routine, although I had seen him earlier in the hallway. I thought that this might be a good opportunity to start one-on-one cogen with Steve, so, I asked him to come for a cogen meeting. He came to the meeting with a sketchpad, and said that the reason he did not show up to the class was that he went to the art teacher (Ms. Paterson) to prepare his portfolio for the audition for the Arts and Design High School. I was pleasantly surprised, because prior to this meeting I did not know that Steve was such a great artist. In a previous conversation with Steve, he mentioned that the only teacher that the class respected and listened to was Ms. Paterson (an African American art teacher). When I asked him to elaborate further on why he believes this, he mentioned, "Because she is black". His statement disturbed me greatly, because it implied that I might not have a chance of improving teaching and learning in my class, solely because I am not phenotypically black (I came from multiracial background.) In this episode, I decided to investigate the role that race might play in structuring the perception of my students of what a good teacher might look like. The participants in the one-on-one cogen explored possible indistinctness of an individual word or phrase in different contexts.

Episode 3

Turn	**Speaker**	**Text**
1	Shady	do you think the color of your skin should determine who you are?
2	Steve	=actually::no but some people judge you that way, because if you are black::you know::: when you watch the movies:::when there is a black person in the movie he has to be a gangster or something::every chinese person got to know karate or something:::a White person has to be rich
3	Shady	{1.3} ((laughing))yeah::stereotyping
4	Steve	=that is how they separate us especially in the movies::that represent what we are at least in the movies
5	Shady	{0.8} ((do you think a black person would have a better understanding of another black person than let us say a White person?

6	Steve	=yeah::because they share the same circumstances
7	Shady	=maybe you are right::but that is not always true (0.7) take michael jordan for instance (0.5) he might have experienced economic hardship at one point:::but his kids grew up in money; probably they don't know what it means to be poor (1.5)
8	Steve	yeah ((looking down at his sketchpad, and goes back to his drawing))

In this vignette, our roles were reversed Steve was the teacher, while I was the learner. He provided me with an insider perspective on race, and race relationships as macro structures, and how some black students might view other races. This role reversal indicated that one-on-one cogen has the potential of creating a polysemic and polyphonic structure that might have the potential of fostering an inherent respect for diversity. For example, my perception of what a good teacher should look like was different from at least some of my students. Steve educated me about his perspectives on race during the one-on-one cogen, where he felt that shared skin color meant common experiences. I also had the opportunity to explain my view of race, and how social class in my opinion will eventually replace race as the stratifying factor in the American society (Shady 2014).

The one-on-one cogen provided the structural resonance that afforded expanded agency for both of us. It allowed Steve to express his opinions about race without fear of being mocked by his peers, and it provided me with the space and time to get clarification on how race might construct the students' perception of what a good teacher should look like. Although, I might have disagreed with him on the fact that every black person experiences economic hardship, this difference in opinion did not produce negative emotion (turns 05, 06, and 07.) In a later conversation, I asked Steve why did he look down during (turn 08) and decided not to continue the conversation? He said he did that because of time constrain; he had to deliver his sketches before the end of the day, and his work was not going as fast as it should have been. There was no breach in the fluency of the conversations. We took equal turns, with no discernable pauses.

One-on-one cogen with Star

The cogen team chose the next vignette because it addressed the issue of privacy, and how reorganizing the cogen into one-on-one facilitated the structuring of a field that fostered privacy. During episode 4, I asked Star to come-in for our first one-on-one cogen during her lunch period. I felt that Star was in general doing much better in her classes, and I wanted her to know how I felt about her academic progress, and get her perspective on the new structure of cogen.

Episode 4

Turn	Speaker	Text
01	Shady	there is something that I would like to commend you on:::you have been coming to the class in time, instead of hanging out in the hallway (1.3) you know what i want you to do? i want you to keep track of instances that are related to science education in your home life, and record them in the notebook that i gave you (0.7)
02	Star	((shaking her head in approval)) ok
03	Shady	=fair enough? (0.9)
04	Star	as a matter of fact Ramiek asked me if he could do what we do:::he would like to come to the cogen, and start doing what we do::he thinks it is fun (0.5)
05	Shady	i would love to (0.3) by the way what do you think of the new arrangement? (0.4) of us meeting one-on-one?
06	Star	=I think it's better
07	Shady	[why?
08	Star	=because when we talk:::we all talk at the same time, when a subject come up, one person jump-in, and then you say let me say somethin, and it is good cause:::when people say somethin they don't keep it here:::i say somethin::they go around sayin ooo::h Star has problems with her mother:::and this and that::that is why i like it:::i feel if i don't want everybody to know about me and my family::i know whatever i tell you (0.5) you keep it to yourself
09	Shady	[you know that i will keep it
10	Star	[i know::that is why i tell you:::i don't tell nobody else (0.9)

11	Shady	well, I tell you the truth:::i feel more comfortable with this design, because if you have a problem that is not directly related to what is going on in the classroom in terms of teaching and learning and start talking about it, someone else might have the same problem (based on my prior experience in the group cogen meetings), and before you even know it everyone is talking about his or her problems, and nobody is talking about education:::the way i look at it is education provides you with the opportunity to change what you don't like in your life

In turn 11, my cultural background played a hegemonic role, with all the macro structures in Star's life that prevented her from accessing much needed resources to succeed academically, unconsciously, I could not help but asking her to focus on education. This is an example of praxis, which is knowledge in action, only after the fact that I reflected on the conversation and assessed the possible impact of my utterances on Star. The cogen represented a field where we talked across categorical differences, such as, social class, race, and age; and because social fields are borderless, cultural practices from other fields appeared in cogen and vice versa. The one-on-one cogen provided opportunities for Star and I to discuss issues that might have affected her education without fear of divulging her privacy. Star brought out an important issue during our conversation, which is a possible way to maintain the privacy of the participating students in the cogen. Because most of the students in this class lived in the same housing project, maintaining the privacy of the cogen's conversations was an important issue. For urban youth maintaining respect in the street is an important aspect in their lived experiences, it is a survival concern that guarantees no one would "mess around with them". Accordingly, respect is not only a commodity that could be traded in the capital exchange helix (Tobin 2007), but also is a safety subject that guarantees their endurance in their immediate surroundings.

As the teacher-researcher in this study, I came across few instances where issues were brought up during the cogen conversations that were not included in the IRB approval, such as, the previously mentioned situation with Star. However, how all aspects of social life could be predicted before starting the research? For example, if a student is experiencing a difficult home life and would like to talk about it, shutting down this impulse in itself is hegemonic. Accordingly, as a teacher, I struggled over where to draw the line and divert the conversation into other topic. Overall, I felt that the quality of the cogen conversations improved because of the

new design. They became fluid in nature with no discernable pauses. We exchanged turns, and maintained a mutual focus on what mattered most to us. The one-on-one cogen design provided the structure that afforded the expansion of agency for all the participants. Participating in one-on-one cogen helped me gain the social capital necessary for establishing successful teaching environment. I became more sensitive to my students' needs, and that in turn helped foster an atmosphere of mutual respect that evolved over time to better learning environment.

GROUP COGEN

The success of the newly designed cogen provided me with the opportunities to expand the successful interactions to a large cogen group. I proposed the idea to the class, I told them that it was Ok to join the group cogen, but also it was Ok if they decided not to join. I made it clear to them that the intention of the cogen was to improve teaching and learning in the classroom, which meant that all the participants were going to have a shared responsibility for developing a successful learning environment. The next episode highlights our first meeting as a group. The cogen team chose this vignette, because it represented a shift in the students' ontology. Contrary to their patterned behavior of resisting me, ridiculing each other, and not participating in the class, collectively the class decided which governance rules to institute and what are the consequences for breaking such rules. Although, I felt that some of the rules were hegemonic in nature, the students stuck to these rules over time, with the exceptions of few times.

Episode 5

Turn	**Speaker**	**Text**
01	Shady	soo↑:: what do you think? (0.5) we have to come up with class rules
02	Maria	=give↑me a board so we can post it (0.7)
03	Tre	no↑cutting (0.5)
04	Maria	what↑you all do in mr. shady's class? (0.4) yeah no talking
05	Ramiek	[how about my favorite one?::no cell phones
06	Najee	=yeah↑how about no iPod (0.9)
07	Maria	((laughing, and pointing at Najee)) why are you looking at me? (0.6)
08	Najee	((laughing)) if you bring yours↑:::i am going to bring my mp3 player
09	Tre	=treat your classmates with respect

10	Stephanie	[like this is going to happen in this class ((raising her eyebrows and looking at the group))
11	Shady	=what? (0.5)
12	Stephanie	treating↑your classmate with respect ((laughing))
13	Shady	=now:::we didn't discuss what happens if someone break the rules
14	Maria	[so you want me to write what happen if we break the rules? (0.5)
15	Shady	what are the consequences if you break the rules
16	Najee	[you↑get a call home
17	Tre	=what↑else?
18	Shady	[how about if you obey all the rules, or part?
19	Maria	[it's all here:::you get to be invited to pizza party, and go on the next trip

The dialogue in this vignette is characteristically continuous, with overlapping speech occurs. There are numerous examples of synchrony, such as, laughing together. At the mesolevel, the clearest examples were that utterances were coordinated with gesture, body movements and rhythms. I moved between being central to the periphery. The students were energetic, called out loudly, and interacted in ways that reflected their enthusiasm and high energy for being central to the decision making process. Networks of transactions were evident throughout the classroom. There were plenty of evidences supporting the emergence of solidarity expressed in voice intensity and gestures. Synchrony occurred where students took equal turns in the conversation with no one voice being privileged.

THE POTENTIAL OF COGEN

Diversity in race, ethnicity, and social class is bound to continue, due to the nature of globalization and the dream of establishing a world without borders. The role of education in such global environments is critical in achieving equity. It is essential to identify how cultural and social perceptions among the stakeholders might mediate the interest of urban students in science. The research conducted in this chapter is an authentic ethnography that aimed at capturing segments of social life in urban schools. As the teacher/researcher in the study, I had to learn how to interact successfully with my students and they had to learn how to interact effectively with me across categorical differences, such as, class, race, ethnicity and age.

Cogen became seedbed for the production of a new culture that was oriented towards success inside and outside the classroom. The findings of the research reveal that using cogen in the classroom has expanded the agency of all participants, and in particular urban youth from one of the most challenging situations. Moreover, the results of the study showed that participation in cogen provided opportunities for the students to identify the macro|meso|micro structures that truncated their agency, and collectively as a research team we developed approaches to alter these oppressive structures. The outcomes of research have shown an increase in peer's learning, and the frequent use of science discourse in establishing their scientific arguments, pointing to the importance of the structural features on the students' learning outcomes. By examining the emergence of growth of new understandings in practice and development through cogen, I, together with my students, created the space to build a collective framework to inform learning standards, practice, and citizenship. Because social fields have no boundaries, some of the new skills, and practices acquired in the cogen sessions got reproduced, and transmitted in the classroom and in other fields. I have learned through cogen the value of respect, and its centrality in youth culture. Hence, I made sure that I was friendly, fair, and firm in dealings with the students, but most importantly when to confront a student regarding a mishap, and when to let go. I dealt with misbehavior in a decisive and brief manner. Therefore, even when my interactions led to the production of negative emotional energy, I followed that with an appropriate repair ritual (Pitts 2007), such as, apologizing, or joking with the students at the end of the class, and explain why I acted the way I did. Hence, the participation in cogen gave rise to a culture of improving teaching and learning of science across different social fields.

The conversations during cogen became resources to draw upon in designing research protocol, interpreting data, and transforming cultural practices that were not conducive to teaching and learning. For example, after the students' recommendations, I reduced the incidences of some practices, for example, one of the issues addressed during the cogen sessions was the impact of the scientific discourse on subverting the goal of "science for all". In dealing with this concern, I mentioned my view of scientific discourse as an accessibility issue, and how it would expand the students' communication skills. The cogen team composed of Star, Steve, and myself then developed different procedures that supported student comprehension of science content. Such examples are pre-assessing student's knowledge of relevant vocabulary terms through cooperative learning during a word grouping activity, and teaching mnemonic devices for easy memorization of definitions.

In reconstructing the cogen sessions, I used one-on-one cogen as a tool to narrow the cultural diversity among the participants (students and teachers.) Because of the structure of the one-on-one cogen the "Othering" process was not as explicit, as it was in the traditionally designed cogen (teacher-researcher, and two or more students.) The results show that the one-on-one cogen became a site that catalyzed positive change, and improved cultural adaptivity among the participating stakeholders. It provided the participants with the time and space to improve their understanding

of the factors that might contribute to cultural misalignment between teachers and students. Participating in the one-on-one cogen sponsored the production of an interstitial culture that is polyphonic and polysemic.

During the one-on-one cogen, I got the opportunity to discuss issues related to race, social class, and self-governance. For example, in my conversation with Steve about how the race of the teacher might mediate the outcome of teaching|learning in the classroom, he elaborated that the construction of race as an identity marker is mainly a media product. Thus, if you were black you would normally appear as a gangster, if you were Chinese you have to know Karate, and if you are white you have to be rich. In return, I had the opportunity to explain that the construction of race, and race relations is a situational. For example, in Egypt race might not be the most salient categorical representation, but social class, and tribal affiliation are the key stratifying factors. Through our conversation, and others alike I had the opportunity to explore the stance of some of my students, and they got the opportunity to explore my standpoint. The cultural practices in the cogen were transmitted to the class and vice versa, because social fields are sites where culture gets enacted, and these sites overlap in a boundless continuity.

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