

De/settling powered differentials and disciplinary practices through rightful presence: Examining how power, emotions, and resistance shaped emerging epistemic ideals in middle school science

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Abstract: There is a growing body of scholarship in science education that attends to the role of emotions and affect as shaping youths' negotiation of and experiences with disciplinary science practices towards more expansive understandings of how youth make-meaning around science phenomena. This study builds on this growing scholarship by examining how power and positionality shapes emerging emotional configurations in classroom spaces. Grounded in a larger study involving implementing a justice-oriented middle-school biology unit, we utilized interaction analysis methods to examine how care for the well-being of the 'other' co-operatively emerged as an epistemic ideal when creating a community ethnography and was shaped by de/settling powered differentials; disciplinary practices; and youth and facilitators' powered positionings in relation with macro sociopolitical worlds. This work contributes to our collective understanding of sense-making in science classrooms by nuancing the complex nature of engaging in allied sociopolitical struggles in explicitly justice-oriented learning spaces.

Introduction and motivation for the research

There is a growing body of scholarship in the learning sciences that attends to the role of emotions and affect as shaping youths' negotiation of and experiences with disciplinary science practices towards more expansive understandings of how youth make-meaning around science phenomena. For example, Jaber and Hammer (2016) document the importance of 'epistemic affect' in encouraging and sustaining youths' engagement in science practices, arguing for affect as entangled with conceptual and epistemological dimensions of science learning. Building on this and drawing on the relations between emotions - conceptualized as "the way that 'affect' becomes mediated, categorized, and meaningful to individuals and collectives as a matter of learning" (Vea, 2020, p. 236) Lanouette (2022) illustrated how children's science practices were shaped by place and emotion. That is, emotions and affective dimensions of lived experiences not only encourage and sustain engagement, but shape how youth engage in science practices, and the directions their investigations follow. Taken together, this growing body of literature illustrates the importance of emotions in science learning and has challenged how scholars understand the commitments and values that inform science practices, for example modeling science phenomena (Pierson et al., 2022). This study builds on this literature by attending to the role of emotions in shaping disciplinary practices, with a focus on how power and positionality shape emerging emotional configurations in classroom spaces. Grounded in a larger study examining the implementation of a justice-oriented middle school biology unit, we examine the role of 'care for the other' in shaping disciplinary science practices. Specifically, we ask: *how was care for the well-being of the 'other' when creating a community survey in an explicitly justice-oriented curriculum shaped by powered differentials; disciplinary practices; and youth and facilitators' powered positionings in relation with macro sociopolitical and cultural worlds and towards what ends?* Through interaction analysis of two lessons where adults and youth were constructing a community survey, we traced how different participants enacted their Rightful Presence (Calabrese Barton & Tan, 2019) in the classroom, through negotiating emotional configurations (Vea, 2020) towards co-operatively constructing (Goodwin, 2017) epistemic ideals (Chinn et al., 2014) as part of the survey design. Overall, this work contributes to more a critically nuanced understanding of how different powered differentials and emotional configurations shaped the emergence and sedimentation of disciplinary practices through an explicitly justice-oriented middle school science curriculum.

Theories informing this work

We drew on three distinct theoretical frameworks to inform our analyses of the community-survey episodes: a) Rightful Presence (RP; Calabrese Barton & Tan, 2019), b) Emotional Configurations (Vea, 2020) and c) Aims, Ideals, and Reliable Processes (AIR) model of epistemic cognition (Chinn et al., 2014). Together they illuminated how feelings and sense-making around care were shaped by powered relations, discipline-informed epistemic aims, and resistance and rightful presence.

The RP framework works towards making visible and disrupting settled powered differentials (e.g., teacher-student) that position youth as ‘guests’ and adults as more powered ‘hosts’ who extend rights to youth. Challenging this ‘inclusive’ approach requires adults working as sociopolitical allies ceding power to youth to re-author the “rules of the game” in these spaces (Calabrese Barton & Tan, 2019). Working towards RP is central to consequential learning and entails shifting powered relations such that students’ whole selves are legitimated and valued as central to learning (Tan et al., 2019). We drew on the RP framework towards identifying the ways in which youth re-authored their rights through disrupting powered hierarchies and disciplinary norms, along with tracing the adults’ moves towards allied political struggle in the negotiation of the community survey.

Learning from Tanner Veal’s (2020) work, we take up emotional configurations to analyze emotions as situated in and shaped by (and shaping of) social practice, and the meaning-making around that practice. We understand emotional configurations as embodying the relationships between feeling, sense-making, and practice, shaped by norms and powered relations. What feelings are permissible, by whom, and towards what ends are therefore determined and shaped through sociopolitical relations. Emotions and emotional configurations are thus political and can serve to guide sociopolitical action, shaped and guided in learning environments. That is, ‘guided emotional participation’ in learning spaces entails “cultivating arrangements between feelings, sense-making and practice” (Veal, 2020, p. 332) towards particular learning goals. In this view, emotion is both a condition for learning and a target of teaching that can drive sense-making. This framework provided a lens to analyze the ways in which feelings were entangled with sense-making around the practice of constructing a community survey and how differentially powered participants in the classroom guided and shaped these emotional configurations.

The AIR model posits that knowledge-building communities hold norms about what counts as worthy epistemic aims, reliable processes to achieve those aims, and ideals (criteria) used to evaluate the quality of the epistemic products and determine whether the aims have been achieved (Chinn et al., 2014). A community’s epistemic ideals and reliable processes may change over time as new ways of doing and knowing develop and may also be in tension with each other. We drew on the AIR framework to trace how aims, ideals, and processes were shaped by members of a classroom community within the disciplined (science) context of survey development.

Study context

This work is part of a larger grant-funded project to develop a middle-school science unit through critical participatory design research methods (Bang & Vossoughi, 2016) in collaboration with youth and teachers from the local area. After a year of collaborating online, the design team of middle-school youth, teachers, and university researchers developed a 7th grade science unit on stress in our bodies and community (Krishnamoorthy et al., 2022). The unit was piloted in Spring 2022, in one 7th grade science classroom at Oak elementary school, located in a sanctuary city in the NE-USA where 90.2% of the students in the district identify as Hispanic (1). While youth did not often openly discuss gender and sexuality, one youth identified as transgender. At the time of this study, the science teacher - a cis-female immigrant from a middle eastern country - had taught the youth for half a year in-person. The support teacher - a Black and African American cis-female - began working at the school a week prior to the unit enactment. Along with the teachers two university researchers - Rishi a genderqueer [they/them] South Asian immigrant, and Ravit a white cis-female Israeli immigrant - helped facilitate discussions.

The unit investigated stress as a non-neutral biological phenomenon shaped through various structural systems of oppression (racism, classism, sexism etc.), by supporting youths’ RP and epistemic agency in the classroom towards making consequential changes to inequitable and discriminatory issues in their local (classroom) community. The episodes analyzed occurred two weeks into the unit, when youth were tasked with creating a community survey to collect data on “what causes stress in the community”. Over two days, Rishi and Ravit co-facilitated the class’s creation of a pilot survey through a combination of small and whole-class group work. The initial survey was piloted with other 7th graders in the school, revised by the class, and sent out to community members across the city. The episodes analyzed include the pilot survey creation and revision lessons.

Methods

Data for this study includes field notes, material artifacts (PowerPoint slides), and audio and video recordings of whole class discussions and 2 focal youth (Batman and Ren). We analyzed episodes that involved whole group meaning-making around the creation and revision of the survey and used interaction analysis methods (Jordan & Henderson, 1995) to trace the emergence of care as an epistemic ideal in deciding reliable processes for learning about stress in the community. We traced how meaning-making around ‘care for survey takers’ feelings’ was co-operatively (Goodwin, 2017) constructed through utterances in the whole-class public space and focal youths’ interactions with each other, across the lessons. Briefly, co-operative action refers to the co-operative construction of something (in this case an epistemic ideal) through joint-activity that involves humans “performing specific

operations – most importantly decomposition and reuse with transformation – on materials provided by another” (Goodwin, 2017, p. 6). In the analysis, we identified how various youth and adults took up substrates – the “local public configuration of action that is operated on to build the next action” (Goodwin, 2013, p. 11), and transformed them towards the co-operative construction of ‘care’ as an epistemic ideal (AIR) through shifting emotional configurations. We then examined the participation frameworks (Goffman, 1981) of the adults and youth through shifting speaker roles (i.e., author and animator) to examine how power was enacted in (re)producing and de/settling powered differentials (e.g., teacher-student power dynamics, RP). Briefly, the ‘animator’ is a voice box through which an utterance is produced whereas the ‘author’ is the originator of the content of the utterance (Goffman, 1981). Furthermore, at any given moment a speaker can assume one or more speaker roles “based on their understanding of their own involvement and of others’ involvement in an encounter” (Marks, 2012, p. 3). Analyzing speaker roles helped trace shifting participation formats towards the illustration of how participants negotiated powered dynamics through meaning-making as a joint-activity. The two hotspots analyzed illustrate how sense-making around care: 1) emerged through youths’ resistance to extractive data collection practices by re-authoring teacher-student powered differentials and 2) was shaped by an adult’s recruitment of their positionality as a minoritized person in relation with macro sociopolitical worlds.

Data Analysis and Findings

“That’s just gonna make them upset”: Care for the ‘other’ as an epistemic ideal

When beginning the ‘community ethnography’ lesson, Ravit facilitated the activity set-up and explained “you already know what is causing stress for you. But remember yesterday [...] there were differences and not everybody gets stressed about the thing, the same amount [...] so we wanna find out what do other people in our community [...] what is stressing them out” because “ultimately at the end what we wanna do is come up with some solutions” to issues that caused stress in the school. In this way, the adults’ enacted power towards shaping the epistemic aims of the survey – to extract data regarding stress from the youths’ communities that would help the youth create solutions to issues in their school. That lesson, youth worked in groups of four to propose questions for the survey. Then, Rishi and Ravit took up each group’s proposed questions in a class discussion to select and finalize the pilot survey (See Figure 1).

Figure 1

Slide displayed in front of the class with each group’s proposed questions

Each pair will add: 2 questions about participant demographics (identity) 2 questions about <i>causes</i> of stress 2 questions about <i>solutions</i> for stress			Community Survey Questions 		
Demographic questions		Causes of stress questions		Solutions for stress questions	
Age?	household income?	What causes you stress?	How do the people around you cause you stress?	On a scale 1-5 how much do teachers cause stress?	What do you do to relieve stress?
Gender, ethnicity	what is your gender?	Is overthinking cause of stress? is assignments causing stress?	on scale 1 to 5 how much stress cause by teachers?	1-5 how much does your home life cause you stress?	Are there people that help you through stress?
Do you make a good home life?	Gender? OPEN ENDED Age?	what causes stress more often?	What subject stresses you the most?	Does your identity cause you stress?	What is your go to for when you are stressed?
					Is having a friend with you helping YOU with stress? is doing things you love help you with stress?
					on 1-5 how does talking to family help you relief stress?
					on 1-5 how does video games get rid of stress?
					Would a day with no work help your stress?
					on scale 1 to 5 which would you rate these solutions for stress? Listen to music. Breathing exercise. Destroying stuff.

The first hotspot episode began when Ravit oriented the class to a proposed question about survey takers’ income (See Figure 1, under the ‘demographic questions’ column). Initially, the class spent a few moments sense-making around the word ‘income’: “money” (2), transformed to “paycheque” and “how much” one earns, relating the ideas to data they explored the prior lesson that showed how income was related to stress. Then, for the remainder of the episode they discussed whether to ask survey takers about: 1) what their income was and 2) if

so, how to ask the question. Through the discussion, youth were initially resistant to asking about income as it would be “weird” to ask middle schoolers who did not earn money about their income. However, as a whole class, they reasoned through this issue by adding the option of “teleporting” middle-schoolers to versions of the survey that did not ask about income. On the verge of a resolution in deciding whether to ask about income, Ravit called for the class to pause, and “trouble it a bit more”. She asked, “do you think people will feel comfortable saying exactly how much they earn?”. Ravit’s question leveraged the emotions of the ‘other’ (i.e., survey taker) to guide youths’ sense-making in their negotiation of reliable processes regarding what and how to ask questions. The youth were quick to agree with Ravit, that a question on income could cause survey takers discomfort, raising issues about data surveillance and privacy so often abused by “companies” who ask for “too much information, bro”. In taking up Ravit’s bid to consider a survey taker’s experience of discomfort, youths’ sense-making around survey-takers imagined feelings were shaped through their (the youths’) relations with macro sociopolitical powered dynamics concerning data surveillance and privacy and became consequential in shaping the group’s epistemic ideals around care for survey takers’ well-being. That is, youths’ relations with extractive practices enacted through powered entities such as corporations shaped: 1) how they collectively made sense of Ravit’s bid to care for the ‘other’ and 2) the epistemic ideals that emerged as a result.

In the next few moments, tensions emerged within the group, with some youth arguing to keep the question on income by asking it in a generalized way (e.g., income ranges) so that it could protect survey takers’ privacy, while also meeting the task aims – to collect information from the community. Others however, argued that it “still won’t work”. Finally, Travisloot appealed to Ravit, who invited him to share his “reservation”:

Travisloot: Cause like don’t like, most people like if they wanna like. Paycheque has to come like they’re like stressed, and like you like ask like is your income like low high like then like if their income is like low that’s just going to make them upset and they’re not gonna want to continue to like.. because... they are not going to want to..

Travisloot’s resistance animated the feelings of stress that a person might experience when their ‘paycheque has to come’, as being invoked when having to answer a question about whether their income was low. His argument not only took up the sedimenting epistemic ideal of considering survey takers’ feelings of comfort when designing the questions, but also argued that not attending to this ideal would result in the survey epistemic aims not being met – that people would not continue in filling out the survey. Travisloot’s resistance not only addressed consideration for the survey-takers’ feelings but positioned it as necessary for the goals of the activity as determined by the facilitators (in positions of power). Eurocentric framings of data collection have procedures around not causing harm (e.g., IRB protocols), reasoned against what is ‘necessary’ for the research aims. Asking about income to ascertain whether it is a source of stress would classify as a ‘necessary’ process. Yet, when consideration of survey takers’ feelings sedimented as an epistemic ideal, the boundaries of what counted as ‘necessary’ processes in data collection shifted - re-authored through youths’ resistance. Positioning feelings (of the ‘other’) as integral to sense-making challenged ethical boundaries that shaped what was sensible to ask survey takers. Youth challenging ethical boundaries through resistance continued as the interaction unfolded.

Initially, Ravit argued that “we can leave that question to the end”, a practice she admitted was a “bit of a trick” to ensure participants would continue the survey despite the emotional cost. However, Travisloot’s resistance persisted, arguing that “if we put it at the end then we’re gonna run into the same problem. They might just like leave the quiz like unanswered and we’ll never get their answer”. Through his resistance, this youth’s utterances unsettled adult-youth power differentials – where many members of the class including the adults were pushing for the question to be included – by skillfully arguing for a consideration of survey takers’ well-being as aligned with the aims of those in positions of power (and Eurocentric science ways of knowing). The epistemic ideal (care) was not only shaped through “how important [that] information [is] for us”, as Ravit asked moments later, but also whether – as Travisloot argued – it would contribute to the data extraction aims of the survey. Ultimately, another student suggested the question be taken out, which the whole class agreed with. When framed as aligned with disciplinary goals by the youth, consideration of survey-takers’ wellbeing was ratified by the adults in power as an ideal in developing reliable processes to learn about stress through the community survey.

“I don’t wanna judge peoples’ gender”: Care for the minoritized survey taker ‘other’

In the next episode ‘not causing stress’ emerged as a sedimented ideal in developing reliable processes and was recruited by Rishi towards advocating for the well-being of gender-minoritized community members. The hotspot occurred the next day when youth were analyzing the pilot survey results and refining their questions to make the final survey. The whole class was analyzing responses to the open-ended survey question “what is your gender”, where one responder wrote in “transformer” as their gender (See Figure 2).

Figure 2

Slide displayed to the whole class with pilot survey answers on the left, and the gender categories that emerged through the group discussion typed on the right in larger font

2. What is your gender?

Male	Boy
Male	Male
Male	Male
transformer	female
male	girl/female
Girl	I'm conflicted on my gender.
Male	Male

male/ boy
Female/ girl
transgender
non-binary
Unsure
My gender preference
is not listed here
List it

Figure 3

Whole class (public space) and private conversation between Ren and Batman. Public space utterances listed with line numbers and private space utterances listed with alphabets.

Whole Class	Ren, Batman
[1] Rishi: Ok so with this question, what is your gender, who which groups had suggestions for this question. Who was not happy with it? [2] Student: me [3] Rishi: Ok lets start with you, Recorderboy. [4] Recorderboy: ((points to Juan white wall)) no, him [5] Rishi: No you say it! [6] Recorderboy: Him [7] Rishi: nods ok [8] Juan White Wall: Okay. Uh people fooled around and not putting a valid answer so uh I said we could just have three categories. Male/Boy. Female/Girl. And others, and have a text box of options. [9] Rishi: Ok so we have one option from Juan White Wall who says people start to fool around. I saw a transformers there I don't wanna judge peoples gender, you can identify as a transformer if you want to, but maybe that's not so helpful for our survey. That's a suggestion here. So Juan White Wall is saying lets have three categories, lets have Boy/ (1.0) Male? Girl/Female, and then an Other. What do other folks think of this. Rose you had your hand up	[A] Batman: hmm ((sigh chuckle)) transformer ((looking up at board)) ((Ren raises his hand, Batman smirks and turns to Ren)) [B] Batman: [inaudible] [C] Ren: The [fact] that someone put transformer ((turned towards Batman, laptop in his lap)) [D] Batman: [nah] ((nods no)) [E] Batman: What do you mean? [F] Batman: ((taps left fist on table, looks at Ren)) ah Yeah. ((Grabs plexiglass and slides hand down)) I-I like that one [G] Batman: I'm a T-Rex. ((Ren giggles, fidgeting with his pen)) [H] Ren: I'm an attack helicopter [I] Batman: You're an other? ((Whispered surprised tone, turns to Ren)) [J] Ren: Other? (2.0) Can you be like LGBTQ- [K] Batman: -((clicks teeth))No just do other ((points hand at board))

Initially, in both the whole class discussion and the private space with Batman and Ren (See Figure 3), the youth took up some of the utterances as not “valid” [8], where “the fact that someone put transformers” [C] was an illustration of survey takers having “fooled around” [8]. In their private space, Batman, and Ren – through humor – elaborated on transformers being an invalid option with Batman authoring himself as a T-Rex [G], and

Ren, as an attack helicopter [H]. In the public space, Rishi re-animated Juan White Wall's utterance but re-authored him as "not wanting to judge peoples' gender" which positioned "transformers" as a potentially valid gender option [9]. That is, Rishi enacted power – as an insider who is trans and an adult in the room – by re-authoring the youths' meaning-making around transformers as him *not* wanting to enact a deficit positioning of survey takers' intentions. In this move, Rishi authored care for survey takers – that they are not judged by their choices – animated through their transformation of Juan White Wall's substrate. Yet while care for survey takers was framed as important, transformers remained an invalid option since it did not align with the goals of the lesson activity [9]. That is, while 'judgement' around survey takers' intentions were not ratified as a reason to discard transformers as a gender choice, 'helpfulness for the survey' was. Therefore, the unreliability of the process – asking an open-ended question about gender - shifted from survey takers' affordances for fooling around to being less helpful in attaining the survey designers' needs for information. In doing so, the boundaries around gender options that *would* be valid were defined by whether they or not they were 'helpful' for the survey.

What ensued thereafter was whole class – and informal small group chatter – around the categories that should be listed in the close ended question. Male/boy and female/girl were suggested as two options by Juan White Wall [8] and a few other students in subsequent utterances, and sedimented as the taken as accepted first and second options. Youth then struggled to decide on other options to propose. Some suggested 'other' as a category in both the private [K] and public spaces [8] (as examples), while others suggested "transgender", "unsure", "non-binary", "pronouns" and then "gay, lesbian, LGBT, asexual". As the youth broke out into dispersed chatter, Rishi raised their voice and appealed to the whole class (See Figure 4).

Figure 4

Whole class and private conversation between Ren and Batman. Public space utterances listed with line numbers and private space utterances listed with alphabets.

Whole Class	Ren, Batman
Students talking all at once, Micky raises his hand and Rishi walks up to him, bends down and listens [10] Micky: So I put like uh a bunch of options [[inaudible]]	[L] Batman: I sure, not sure and then you coulda ha- you should have other still [because what if] somebody wants to be a T rex? ((Gazing at Ren as he talks)) [M] Ren: [Because someone] ((Ren giggles)) [N] Ren: What if someone wants to be a T (.) rex (.) ((Batman leans into Ren)) [O] Batman: No but actually WHAT if someone wants to be som-
[11] Rishi: Ok so we have one more. Y'all this a really important question, right, and I am saying this as someone who is trans, like when I have to pick my gender on a on a survey, often the option I want is not there. cause I identify as genderqueer. That's actually like what I call my gender, and so this question is actually really important because we're asking about stress. We're asking about how people identify, and as Travisloot said last time we don't wanna ask questions in a way that may cause stress. Right? So we gotta think real carefully about how we phrase these questions. what options we give people so that we can consider how it might make them feel to answer them right? And So I like what you are saying we should have lots of options. We can have male, female. No sorry male or boy, girl or female, transgender, unsure, and then you said nonbinary, right? Are there any other, cause I don't know how y'all talk about gender right? how your generation talks about gender. Are there any other ways that people identify. that you know of?	[P] Batman: Just say other!

Across this [L-P] and their previous [A-K] private space interactions, both Batman and Ren reasoned through the options for gender through humor, taking up substrate from the whole class discussion towards a serious consideration of 'not judging' survey takers' intentions [9] when answering a question on gender. In this interaction, Batman built on the sedimenting options for the question, but argued for keeping an open option – "other" – because 'what if someone wants to be a T Rex?' [L]. Initially received as a humorous response – evidenced through Ren's giggling [M] – Batman then re-animated his question, 'what if someone wants to be' [O]. While his utterance was cut off by Rishi speaking into the whole class space, Batman built on the play he

and Ren engaged in earlier [G, H] – where transformers could be a possible and valid option. If so, then providing an open space for survey takers to express an unlisted or unexpected gender would be necessary, as evidenced through his growing support to ‘just say other’ [K, P] as an option for gender.

In the public space, Rishi authored themselves as an explicit insider and knower of a specific survey taker’s experience – a trans person who did not have their gender identity listed on a survey [11]. They framed this context and insider knowledge as important by shifting their positionality to that of a survey designer – with the youth (“we”) – making a survey about stress. Considering non-cisgendered survey takers’ feelings was important *because* the survey they were designing was about stress, informed by Rishi’s previous experiences with answering questions about gender. Furthermore, Rishi framed meaning-making around how to ask about gender as important by recruiting Travisloot’s resistance the previous day as the source for the epistemic ideal of care for survey takers’ feelings as necessary for survey design. For the question on income (previous episode), consideration of participants’ well-being was legitimated (by the adults) as an ideal in building reliable processes because it would not help the group meet the epistemic aims of the survey. In this turn of talk however, care for survey takers was positioned as important regardless of the aims of the survey through Rishi guiding youths’ emotional participation (Vea, 2020) in considering how trans people – like Rishi – would feel not having their gender in the survey. It was no longer the emotions of a generalized ‘other’, but Rishi’s feelings – an adult in a position of power – that the class needed to consider in designing reliable processes for their survey. This epistemic ideal also emerged as the hierarchy in gender categorizations was sedimenting.

While Rishi positioned the youth as the experts who knew how their “generation talks about gender” [11], neither of the gender binary categories were questioned (boy/male; girl/female). Instead, they emerged as obvious options, indicating an assumed acceptance and shared orientation around heteronormativity structured into their understandings of gender (Ahmed, 2006). This emergent gender hierarchy is also mirrored in broader data collection practices that often (re)produce harm towards and the invisibility of non-cis-gendered identifying communities through the powered heteronormativity (and heterosexuality) that structures quantitative methods (Guyan, 2022). In this episode, reliable process for asking about gender necessitated youth recognize their power over survey takers’ (like Rishi’s) feelings, by carefully considering how to ask about non-cis-gendered identities. Batman and Ren’s playful sensemaking around gender options, and Batman’s growing insistence on ‘other’ being a more open and inclusive option (that would allow responses like transformers so as not to judge survey takers intentions) is indicative of the youths’ careful consideration and care for the survey takers’ feelings. Ultimately, Rishi proposed “my gender is not listed here” as an option that would “honor that we did not know” someone’s gender identity, which the class agreed on.

Discussion and Significance

Explicitly justice-oriented curricula necessitate adults work as sociopolitical allies towards youth reauthoring their rights in classroom spaces. In an activity such as designing a community survey, this involved youth and adults negotiating what and how to ask questions to survey takers. In this classroom, ‘care for the other’ emerged as an epistemic ideal through youths’ increasing resistance to extractive data collection practices. That is, explicitly working to desettle adult-youth powered differentials resulted in emotions emerging as integral to sense-making around the ethics of knowledge creation towards more just ends. However, as evidenced in the first episode, this epistemic ideal was not ratified until the youth skillfully reasoned it as aligned with the aims set by the adults in positions of power. At the same time, when care for the ‘other’ sedimented as an ideal, aligned with disciplinary aims, it afforded the adult to advocate for the well-being of non-cis-gendered youth both within the classroom space and those taking the survey. That is, through the ideal of care, gender-alienation through the politics of data collection was elevated as an important consideration in survey design.

What ‘care for the other’ entailed, in nature and degree, was emergent and contingent on classroom interactions. First, survey-takers’ assumed anonymity was reconsidered when youth focused on the locality of their survey catchment area – in their own community. They were not designing a survey to be sent into the void but asking salient questions about stress to their own community. Second, what it meant to care for the well-being of survey-takers gained deeper meaning when the issue was literally fleshed-out – embodied in the personhood of a classmate who identified and performed as queer (a transgender student in the class), and in Rishi- with whom students were relationally entangled. We suggest that a direct interaction of such relational nature solidified for youth the significance and importance of parsing how and why, and to what ends, gender questions ought to be asked in a survey. Third, the tensions between caring for the survey-taker because of its ethical imperative and caring that the survey yielded authentic data because the youth care about the phenomenon of stress in their community, was apparent and tricky to navigate. Across these three considerations, we see evidence of a braiding of emotional configurations with care for the other as an epistemic ideal, towards a more rightful presence for the local community of survey-takers and youth and adult as nested within said community.

Our analysis suggests that attuning to the youths' resistance through bids to re-author their rights in the classroom space along with the role of emotional guidance in shaping whole-group discussions was consequential towards illuminating the ways in which power and positionality shaped the direction of and sense-making around scientific practices. It also points to the complex nature of engaging in allied sociopolitical struggles. Even as student-adult power differentials were obvious, the kind and degree of power differentials made manifest along particular axes (e.g., conceptions of income, gender, the goals of a class survey instrument) were embodied and informed the actions of stakeholders in ways that gave texture to the overall student-adult power differentials. Thus, student-student power differentials; adult-adult power differentials and the potential myriad configurations of such are all productive towards unpacking the nature of allied political struggles towards rightful presence as well as the import of emotional configurations and de/settling epistemic ideals in and through these processes. How do we intentionally and systematically tease out power differentials that undergird such rightful presence authoring work? What are the significant roles that emotional configurations play, that designers of justice-oriented learning experiences need consider, and imbricated in what ways with epistemic ideals? Zooming out, how do we as a field continue to disrupt white Eurocentric scientific teaching and learning with these insights?

Endnotes

- (1) None of the youth in the class identified as white, and a large portion of them identified broadly as Hispanic, though they preferred more specific country-based identities (e.g., Dominican, Puerto Rican, Ecuadorian etc.). While from the same school district, the design team youth were not in the same class or school where the curriculum was piloted.
- (2) All quotes are from youths' utterances unless otherwise specified
- (3) Rishi uses they/them pronouns

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