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Refiguring research stories of science identity by attending to the embodied, affective, and non-human

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This perspective article draws on conversations with a program coordinator in a community organization that guided the development of an after school *Convoclub* for girls, which focused on understanding the role of science in their lives. We examine our conversations with the program coordinator to understand how affective placemaking, brought about by engagement in a digital storytelling project, created a new space for girls' engagement in science. We describe these conversations as part of our "research story"—a term intended to highlight the importance of storying in postqualitative methods. We draw on data from a qualitative case study of the co-designed science activities in *Convoclub* with a special focus on conversations with its program director and our joint work in the design of the club activities over time (i.e., dialogue circles with the six youth participants, a digital storytelling project, and a video documentary about science). Presented in three vignettes, we address the evolution of the club activities and its implications for designing spaces for learning and becoming informal science learning environments supportive of empowering identities in science understood through framing from a posthumanist perspective. Throughout, we consider the implications of refiguring research stories of identity by attending to the mundane yet also emergent stories of assemblages—affectively charged associations of people, places, and things. We consider what this orientation brings not only to the telling of identity stories but also to the co-design of learning spaces and considerations about whose voices and stories are told and heard in science spaces.

KEYWORDS

affect, science education, identity, learning, becoming, digital storytelling, co-design

Introduction

Inspired by materialist and posthuman ontologies, this perspective article proposes an enlarged vision of the construct of "science identity" that researchers have engaged with in science education by centering a plurality of relationships and bringing forward a focus on its embodied, affective, and non-human characteristics. We do so through a presentation of three vignettes drawn from an after school activity for girls known under the pseudonym *Convoclub*. The vignettes offer a glimpse into the co-design of *Convoclub*¹ over time and its pedagogical tools and emergent activities at three distinct moments. By centering the key dimensions within each vignette, we build the argument for a posthumanist perspective on

¹ *Convoclub* is a pseudonym for the club situated within the Cartier Community Centre (pseudonym; the community organization where we conducted this study). *Convoclub* had been running for several years at the organization and was initiated by Darlene, the program coordinator, to respond to the need for more programming to support girls attending the after school programs. More details on *Convoclub* can be read in [Gonsalves et al. \(2013\)](#).

identity that we understand as potentially enriching current research stories of science identity. We present these vignettes as a “research story,” a term we use to center the importance of storying as a method in postqualitative educational studies of identity and, in the light of such a grounding, we aim to share things as they are and bring alive moments in Convoclub to the reader that might appear mundane at first sight, yet as we argue, offer rich insights into non-representational conceptualizations of identity (Zhao and Murriss, 2022).

Theoretical grounding

The perspective article builds on past research that has provided insights as to how learners and teachers see themselves in science and are recognized by others as science persons (Carlone and Johnson, 2007; Avraamidou, 2020; Rahm, 2021; Rahm et al., 2022). Subsequent studies have focused more deeply on the situated nature of identity in multiple sociopolitical realities and its constituted nature by systems of dominance and oppression. For example, Avraamidou’s (2021) study of conferred or withheld recognition and its underlying structure-agency dialectic has led to a deeper understanding of the politicized nature of recognition and how identity intersects with race, gender, social class, religion, and learner’s ethnic/cultural identities. Yet, we contend that stories of science identities in the making are not simply about recognition *per se* but also stories about affective and more than human relations in place, and complex entanglements that take shape and shape us as we live and move in and through life (Avraamidou, 2020; Rahm et al., 2022). Who we have been, are, and can become are processes entangled in trails of life (Ingold, 2011) or trajectories of growth, knottings (i.e., or the making of knots which attests to nonlinear and messy movements), and meshworks (lines coming together in a multitude of ways attesting to the non-linear and messiness yet also complex weaving together of lines resulting in the creation of something new, attesting to the ever emergent nature of identity). We contend that attending to identity in the making in practice is essential and offers valuable insights into this dynamic process that constitutes the continuous remaking of selves in science and its entanglement in trails of life that actual living implies (Ingold, 2011; Rahm, 2021; Rahm et al., 2022). Given such a conceptualization of identity, we ask, how do we then, as educators, work with youth to co-design socially and culturally relevant, meaningful, and empowering spaces within which becoming can be unpacked and reimaged in ways empowering to youth who are marginalized within science education? What does such a co-design imply? In what follows, we tell a research story of this co-design challenge through three vignettes, attending to the embodied, affective, and more-than-human characteristics and then discussing its implications for the refiguring of research stories about science identity. Our analysis was guided by Ehret and Leander’s (2019) discussion of affectively charged associations of people and things in spaces, which they refer to as *assemblages* (e.g., Deleuze and Guattari, 1987). They describe the assemblage as the “coming-together of heterogeneous materials (bodies, things, signs), held together in ways that might allow for durability but also for dividing up and reorganizing into new assemblages” (p. 6). These assemblages (people, places, and things) can produce

“affective affinities” that are not just experienced by one individual in ways that we could describe as happiness, sadness, or anger, but rather are “experienced as the warp and woof of movements involving multiple actors—the everyday movements of people and things approaching and pushing against one another coming up alongside, making a dance-like turn, pulling apart” (Ehret and Leander, 2019, p. 6). Ehret and Leander ask us to consider “what is alive in this assemblage?” and “what does this particular assemblage—in this moment in time—bring to life?”

Context of the research story and its three vignettes

We draw on a video ethnography of Convoclub (Gonsalves et al., 2013; Gonsalves, 2014; Gonsalves and Rahm, 2022), a 10-week science activity we co-designed together with the program director, Darlene (pseudonym), and its six youth participants. The three vignettes build on conversations with the program director, Darlene, and also entailed the consultation of other data sets. The joint revisiting of Darlene’s interview in conjunction with the other data sets led us to craft these three vignettes that we understand as offering key insights into the co-design process of Convoclub, yet simultaneously can be read as crucial for refiguring research stories of science identity.

Refiguring research stories of science identity

We invite readers to engage with the refiguring of research stories of science identity by attending to “a felt force that at once connects and differentiates individuals” (Ehret et al., 2018, p. 3) that each vignette speaks to and that we contend is key to learning and becoming in science through respectful relations. The first vignette speaks of the importance of attending to affect in science clubs, while the second vignette offers insights into how this challenge was pedagogically harnessed through a digital storytelling activity, leading to the third vignette, and challenge of empowerment and voice in and through science, which in the end led to the co-creation of a video documentary about science.

Vignette 1. Co-designing through reflexive criticality and affect

Reflexive criticality marked the co-design project from the beginning and the positioning of selves (the co-authors of this article) as listeners, wanting to work with youth and youth organizers on their own terms (Ali and McCarty, 2020). We aimed for a co-opted design that is humanizing, decolonial, and transformative, supportive of dialogical engagement. We came to this understanding that research in itself “becomes a transformative act” (Steinberg, 2014, p. xiii), implying “a methodological symbiosis of praxis and care” (Ali and McCarty, 2020, p. 5). This requires a recursive research design supportive of deep engagement with complexity and ambiguity, which we take as key to opening up further dialogue and “self-determination of lived lives” (p. 17)

in and with science. We were also immediately confronted with affect as a social force and emerging from “movement and being moved” (Ehret et al., 2018, p. 3; Leander and Ehret, 2019) in and by doing science together. Co-designing implied a beginning where we jointly dialogued about the place and the history of the program and community organization:

we’re not just a community center for the youth, we’re a community center for the community, we see different people come and go, they graduate, and some older people pass and it’s very concentrated on the community, and that means family, and a lot of the youth and a lot of kids and some of the older ones, they don’t have family and... the CO [community organization] becomes their family.

Darlene clearly articulated from the beginning her goal to build strong relationships among the girls in the Convoclub. To achieve this, she sought to create opportunities for girls to open up to each other and “bond.” The space that Darlene and the girls co-created acted as an assemblage that brought to life (Leander and Ehret, 2019) opportunities to share stories of their lives, struggles, and dreams. Darlene argued that this was necessary to ensure that the girls had a place in the community program and could cultivate a sense of belonging. She argued that the girls were sometimes lost in the CO where much of the focus was on physical play, roughhousing, and aggressive but fun behavior. To reach the girls, it was necessary to show vulnerability and to “touch into her sensitive side”:

sometimes they just wanna cry, and that should be ok. So, I had to work on myself and you know, open myself up to receiving you know, their love and for me to be able to give it, ’cuz sometimes they’re like “you know, Darlene, a hug would feel good.” And I didn’t understand that, and they made me get that. And for them it’s just really to have it open up. Sometimes they will tell me something, but its half wasn’t true and now I already know the whole truth because the boys have told me the whole truth, so I just wait patiently (just for them to) open up. That’s the biggest challenge.

As science educators interested to introduce a science conversation program into Convoclub, this also became our biggest challenge. To meet the needs of the girls and the program, while still introducing an opportunity to engage in thinking about scientific issues in our lives. We took seriously this challenge and sought to co-design a learning space that is affectively charged in good ways, supportive of girls’ deep and meaningful engagement in science conversations that matter to them and that they can come to own, emergent from authentic relationships (Gonsalves et al., 2013).

Vignette 2. Learning to listen, listening to learn through digital storytelling

Digital storytelling refers to the practice of incorporating text, images, audio, and video into a moving digital image that tells a story (Chung, 2007), resulting in “short, personal, multimedia tales told from the heart” (Meadows, 2003).

Its creation involves using art-based methods to explore topics (for our group we engaged in a postcard activity and collage), developing scripts, storyboarding, audio recording, image production, and finally, presentation (Chung, 2007). We followed this method over the course of 6 weeks with the Convoclub.

We initially viewed this activity as a way of balancing our intentions (holding science conversations) with the girls’ desires (bonding and investing in relationships; refer to Gonsalves and Rahm, 2022) and the directors’ desires (to create a safe and welcoming space for girls each week and “dig deep”). But upon reflection, we have begun to regard this activity as an open door into which girls were invited to enter and engage with us, a group of strangers, with whom they did not have any previous connection. Smith et al. (2022b) have challenged us to consider how we enter spaces or how we move through open doors and to consider who we are and how we move through these doors. They ask: “How do you enter a space? Do you jump right in? Do you test tentatively? [...] Do you scan the room? [...] Do you leap in and screech with joy? Do you tiptoe and glance over your shoulder before proceeding?” The girls in ConvoClub did all of these things as they approached us and our proposed program on science conversations. Ehret et al. (2018) describe how pedagogic relationships emerge through unspoken experiences of being together, such as groups in churches, at a concert, or family dinners. While we initially developed this activity to generate feelings of belonging and buy-in from the girls to then get to the science conversations, we were there to pursue together, and we have become interested in the digital storytelling activity as a shared experience, an assemblage. Digital storytelling ignited new and unexpected opportunities for learning and unlearning through affective engagement with digital media objects and with others in the group and seemed key to the co-design of a true affinity space, as the following exchange suggests:

Darlene: it was a beautiful thing, but for them to be like “I don’t know, Darlene, this is pretty deep, this is a lot” and I’m trying to get them to go there, you know, dig deeper, and they are like “ah... no,” and they were just giving surface, ’cuz it’s easier, right? So it took a lot of strength from a lot of them, a lot of courage to speak on certain things and to open themselves up. So, it was a challenge for me, like weekly, aside from girls’ group, let’s say Tuesdays, Thurs- Tuesdays, Wednesdays, Fridays, to keep them like- through text messaging to be like “Girls, don’t give up on me.” You know, “we’re not giving up on you, you can do this, it will be okay.” You know, like we had Cailleigh (pseudonym; one of the girls), who was ready to quit, and she couldn’t.

Allison: And she made a beautiful story.

Darlene: And she couldn’t face, like she couldn’t face it [...] ’cuz to talk about themselves is very very hard and they went through it, they did it, and to keep them going and finally, and it was emotional, and I think it brought the group together.

Drawing on affect theory, we regard the digital storytelling activity as creating opportunities for feeling (new things) in ways that might resist representation by language, but nonetheless, yield togetherness and learning (e.g., Ehret et al., 2018). Thus, our understanding of affect here is that it lives outside of the body or between bodies (e.g., Ahmed, 2015) through entanglements with the digital texts and with each other's readings of the texts. The six produced digital stories invited all of us to engage with the following themes that marked their lives: childhood illness, a brother's premature birth, body image, relationship violence, drugs and criminal justice system, and relationship with the mother. Darlene's reflections are telling of the significance of that activity:

- Darlene: They loved it. I think it set the tone for what kind of group we were. If I had to do it again, I would totally do it again.
- Allison: You'd- and you'd do it first like that, and not wait until they are more comfortable with us being there?
- Darlene: No. I would do it first because you get it you... you know, you show your flaws. You show, you know, how you deal under pressure, you- you tell your story, and then everybody is crying and emotional, so it'll- it build that bond and when we (said) "What happens in Convoclub stays in Convoclub," they have never spoken about it. If we were together, we would talk about it; with other people, we were like: "we'd rather not." And they were very serious about that, which I was so grateful, so it created a bond.

Vignette 3. Empowerment in/through science—A leap in the making

Ehret et al. (2018) remind us that while the Convoclub was becoming something in and through relationships and affectively charged intra-actions, this study has to be understood as distinct to identity. Multiple things are becoming and who we are and are becoming is entangled with and marked by the assemblage of moments, affects, and histories in person. In light of this, we may ask, "what affects do these becomings have on other becomings around them" (Leander and Ehret, 2019, p. 7)? Darlene speaks to that:

Once they open up, they never—never—shut up, if I can say that on camera. And they open up and they keep vomiting information, which is excellent, because I keep taking in. They keep talking, I keep listening, 'cuz all they want, I noticed, girls' (all voices) to be listened. For their voice to be heard. They can ramble, but if you're listening to them and exchanging that's all that matters. And now that- that we've built like a rapport and that we're close, and I'm close to a lot of them and a lot of the staff are close to a lot of them, they're able to open up.

The becomings that emerged led to new becomings, girls who have a voice, who have something worthwhile to share

and are listened to respectfully by others with whom they developed deep affinities given the respectful pedagogical relationships activities like the digital story opened up and supported. The girls were becoming somebody given the role they were given in the girls' group and that was upheld by the team:

It's to take ownership, to take to make it their own, 'cuz it's not my program. I'm just behind it. Right. So it's theirs. To take ownership of the program and to bring it to a whole new level. And I think this year we really accomplished that. Like in the sense of a boys- a boy would come into the room, they're like: "Uh... no." So which is, I guess if you take ownership and you- you take- you have pride in your project you'll want to make it better and you'll wanna make it a success, so.

Despite empowering identities in the making, once science was introduced to them, Darlene suggests: "they were not too keen on the idea, at all, 'cuz science to them is related to school and they thought they couldn't express themselves creatively and emotionally through science, so they're like: What is that?" Elaborating on the girls' response to having science infiltrate Convoclub, Darlene explains:

when I first introduced the idea to them, they're like: "Hum, I don't think so." And I'm like "you guys have to trust me. We've been through this together. You guys have to trust me and I have a really good feeling about Allison and the whole thing, so." They really took a leap of faith, 'cuz the first thing they wanted to do was to leave, they were like: "We're not signing up for this." So, they took a leap of faith with science. And they (were) very stubborn with the fact that they didn't know they were like- because they don't have (good) experiences with science at school, right. So, they thought it was [going to be] the same thing...

Eventually, they asked the boys in the CO questions about how they engage with science in their everyday lives, ending their filmed exchanges with the following, "do you have any questions about science?" The latter exchange positioned the girls as being in charge, advising boys about the many ways science touches their lives, and playing with an identity marker they rarely experienced in or outside of school.

Discussion

By attending to the embodied, affective, and non-human characteristics within each vignette in different ways and telling the story of the evolution of the co-design of Convoclub over time, we could make evident in what ways the claiming of identity in science is entangled with multiple histories in person (who one has been and is, how one has been positioned and still is positioned within a community, and also program as a youth, as a girl, as a girl in science in formal and informal venues, etc.) and the affectively charged nature engagement with

science provokes which shuts so many youths out of science right away. As shown, Darlene helped us understand as outsiders the social ecology of which the girls and the club were a part and what defined them and the form the club could take on within that landscape, speaking to entanglements that mark the trails of lives.

Science identity also needs to be understood in light of multiple timescales, captured in part by the notion of trails of life marked by meshworks. Identity engages assemblages of experiences, places, histories, and bodies over time. The vignettes speak to them and draw our attention to the importance of an embodied science identity that resists the separation of the body and the self and its dualism and instead engages seriously with the outside political bodies and the within bodies—memories and trauma. The vignettes challenge static visions of identity or identity as a commodity that one accrues over time. Static conceptualizations of identity miss the complex entanglements and dynamic lifelong processes of learning and becoming across space and time, processes that we understand to form a dialectic and as central to science education. We have developed this argument further by engaging deeply with the affect, wondering what affects these becomings have on other becomings—with affect being something in the air, as emergent from interactions and more than human activity. We engage with the manner bodies—in this case marginalized youth—who come into contact and build relations within an activity in a community organization. By wondering about that assemblage and what it brings to life, we were struck by an affective force in the air that made possible deep relations and forms of engagements and becomings.

Next steps

We leave readers with the following questions for future research: what would and could be in science education were we to center non-dominant voices and challenge the ongoing hegemony of science and science education (Smith et al., 2022a)? Also, what stories would emerge if we endorsed researcher reflexivity fully and would let ourselves be carried away and transformed by our own research, paying attention to “feeling right” (Ahmed, 2015; Ali and McCarty, 2020)? As such, we suggest that methodology is entangled with affect too, grounded in emergent relations charged with affect, taking us elsewhere by challenging long-held beliefs and positionings of selves within the field. Co-designed projects grounded in respectful relations and guided by feminist and posthumanist theories, thus, have the potential to attend to voices and frameworks too often silenced in the field of science education research.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by CEREP Université de Montréal. Written informed consent to participate in this study was provided by the participants’ legal guardian/next of kin.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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