International Society of the Learning Sciences

Emotional Configurations Across Learning Environments

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Abstract: Building on Vea's (2000b) emotional configurations perspective, this symposium examines emotion and learning across a range of environments representing science education and explicitly politicized contexts. An emotional configurations perspective denaturalizes supposedly individual, internal, and discrete emotion states and instead foregrounds the ways that participants in social activity coordinate relationships between feeling, sense-making, and practice. In these four studies, we argue that emotionality should be more centrally interrogated in learning sciences research because it shapes what is learned and how learning unfolds, and itself becomes part of learning outcomes. The combined work makes theoretical contributions by interweaving emotion within sociocultural theories of learning and methodological contributions by sharing productive approaches to centering emotion as an object of analysis.

Framing and contribution: Emotion as more than a feeling

Emotion exhibits complex entanglements with thinking, activity, and learning. Building on Vygotsky, for example, Ratner (2000) conceptualized emotions as "thoughtful feelings" (p. 6). Roth (2007) emphasized that emotion serves as a "constituent element" of human activity (p. 45). And yet, the learning sciences have paid relatively little attention to the role emotion plays in learning processes. This symposium uses socioculturally oriented approaches to interrogate the role of emotion in shaping learning and sense-making in school-based and explicitly political out-of-school learning environments. We look across contexts to attend to if and how emotionality is centered in learning settings and what the consequences of explicit attention to—or refusal of—emotion does to shape the sense that is made of feelings and of conceptual cognition by learners and researchers.

As a starting point for our analyses, each paper in the symposium takes an emotional configurations perspective (Vea, 2020b). This perspective denaturalizes supposedly individual, internal, and discrete emotion states and instead foregrounds the ways that participants in social activity coordinate relationships between feeling, sense-making, and practice. Within this perspective, emotions are understood to be situated and grounded within particular social and cultural contexts (Boler, 1999; Zembylas, 2007). Emotion only becomes meaningful in contexts of activity. In this view, emotion is seen as inherently bound up in social practice—both as a form of practice, in the case of emoting and emotional management, and as entangled with other forms of practice. Ways of feeling can support the effective performance of other practices, such as when service workers use emotion to smooth capitalist exchange (Hochschild, 2012). Further, emotion is governed by norms and shaped by ideology and power relations, with implications for the futures that people can imagine and how they organize themselves to make those futures real. We assume that emotion is collaboratively constructed among members of a community, that emotion's meanings are shaped in and through sense-making processes in community, and that the sense that is made of emotion can, and often does, change as part of learning processes. From this perspective then, any learning endeavor will have emotion as a critical component.

Where and when is emotion in learning? Recent learning research shows concern for how affect and emotion support learning more broadly (DeBellis & Goldin, 2006; Ehret & Hollett, 2016; Gupta et al., 2010; Jaber & Hammer, 2016; Nemirovsky, 2011). Some learning researchers have also suggested ways that emotion may figure as part of learning outcomes, such as "affective know-how" (Hollett & Ehret, 2016) or "emotional engagement" (Sakr et al., 2016). Extending these conceptualizations, emotional configurations provide a way of seeing emotion as dynamic and always in process. Vea (2020b) argued that emotion serves in two modes: as a condition or quality of being that drives learning activity and as a learning target in its own right. The two modes can recursively flow into one another over the course of activity. For example, "epistemic affect" (Jaber & Hammer, 2016) and other forms of feeling can drive learning engagement as people attempt to resolve tensions or inconsistencies in phenomena and thinking. In the course of the same activity, educators and other social actors

may cultivate ways of feeling in relation to sense-making and practice as part of learning goals. Emotion not only shapes what is learned and how it is learned—but is also itself part of the learning, iteratively re-shaping and resignifying the sense that is made (Vea, 2020b; Curnow & Vea, 2020).

In this symposium, we bring together two strands of developing scholarship. First, we identify emotion as an emergent issue in politically engaged informal learning environments. Vea's work has shown how "guided emotion participation" shaped whether and how animal rights activists became engaged in activist work. Through intentionally organized emotional experiences, activists came to make sense of relationships with nonhuman animals and with eating meat in particular ways, which shaped their political development by generating and giving meaning to strong emotional experiences. Curnow et al. (2020) examined the relationship between anger, snarky humor, and learning in youth climate activism. They argue that humor-infused expressions of anger enabled politicization of young women, as it opened space for grievance construction, problem solving, and community solidarity in ways that had been foreclosed in other spaces. Emotion became a mediating tool for expressing feelings that had gone un-named, and enabled participants to frame their emotions within the lens of feminism and anti-racism, making them politically salient within broader transformations of feminist practice, identity, worldview, and political analysis. Curnow & Vea (2020) also synthesize their respective work to argue that emotion is fundamental to processes of politicization. Additionally, we see a proliferation of work that attends to questions of belonging, trust, solidarity, and intimacy (Teeters & Jurow, 2018; Uttamchandani, 2020; Vakil et al., 2016), which gesture to the importance of felt experience, sense-making, and scale-making that is made possible through those relations. While their work does not explicitly orient to emotionality, it points to opportunities to more fully theorize emotional configurations that make feeling seen, feeling at home, feeling part of something bigger more likely, as it traces the impacts of those feelings (Vea, 2020a).

Second, similar threads are emerging in science education research, where there is increasing focus on emotion in children's, teachers', and scientists' disciplinary pursuits in a discipline often framed as unemotional, rational, and objective (Burbules & Linn, 1991). To larger discussions of how to support and design for science disciplinary practices in school and out of school contexts, there is an emerging understanding that emotions are part of what "instigates and stabilizes disciplinary engagement" in scientific pursuits (Jaber & Hammer, 2016), wherein learning science is intertwined in learning to feel and navigate feelings in new ways. Drawing on sociological studies of science as well as scientists' memoirs, Davidson and colleagues (2020) assert that emotions are "part and parcel" of the experiences of scientists, and should be recognized as integral to the experiences of science learners for children and adults alike. Likewise, this acknowledgement of the importance of emotion in the doing and learning of science may further push the field to consider the ways in which opportunities to learn through and at the level of emotion in science are afforded or constrained to populations who may be otherwise marginalized within the discipline (Bang et al., 2012).

When taken together, this work brings a key question relevant to the learning sciences into focus: When, for whom, how, and to what ends are emotions consequential for learning and research on learning? Each paper engages such considerations of emotionality differently: Curnow attends to how emotion shaped the sense-making process in the RadLab's analytic work, while Vea analyzes the emotional configurations embedded in animal rights activists' commitment to non-violence. Lanouette unpacks children's' emotions in a schoolyard ecology unit, while Davidson, Jaber, & Southerland examine the emotional configurations of scientists, teachers, and students. While we explore widely different contexts, from research spaces to activist contexts to school and after-school programs, across the work we attune to how emotion shapes the sense-making process. We find that emotion is present in all of these spaces, shaping what is learned, how, and by whom, and we find that emotion is almost always pushed aside rather than reckoned with as a mediator or target of learning and collaboration. Across the symposium contributions, we demonstrate the diverse ways emotion is consequential for learning. Taken together, the symposium makes three key contributions to emotion in the learning sciences: (1) it offers a range of theoretical enactments of emotional configurations across a wide range of learning environments, integrating emotional attunement into sociocultural theories of learning; (2) methodologically, it offers productive pathways forward for reckoning with emotion as an object of analysis in all learning environments; and (3) it argues that, across a range of learning environments, attuning to emotions can illuminate heretofore underexplored aspects of the learning process. Authors will present papers for 10 minutes each, followed by commentary by our discussants. Time will be reserved for discussion of how emotion should or could be taken up within the learning sciences, and the consequentiality of emotion for learning ecologies. Questions include: How might the learning sciences analyze emotion? What tools do learning scientists have in our repertoires for analyzing emotion, and how might we do so without reifying emotional practices and meanings? How do our own feelings shape how we read our data, participate as researchers, and engage in analysis and theorizing about learning?

Eating a kilo of chocolate as method: How emotional configurations of analysts shape data analysis and sense-making

Joe Curnow, University of Manitoba

In this paper, I examine the role of emotion in analyzing video data of emotionally charged debates. I argue that the emotional configurations of our research collaborative, the RadLab, were highly salient to our ability to conduct analysis of the significance of emotion in the data we analyzed, while also creating a complicated context for being immersed in the data. The RadLab is composed of activist researchers who were embedded in the Fossil Fuel Divestment campaign at the University of Toronto, and who co-designed and led the analysis of two years of video data. Our participation was both as research participants and analysts, drawing on Participatory Action Research frameworks (Brown & Strega, 2005), and militant ethnography (Scheper-Hughes, 1995). Fossil Free UofT was a student-run campaign aiming to convince the University of Toronto to divest from fossil fuels. From September 2014 to April 2016, Fossil Free UofT met weekly to plan events and coordinate strategy. Meetings lasted two to three hours, with facilitation responsibilities rotating between members. The group included undergraduate, masters, and PhD students. Through analysis of over 15000 minutes of multi camera video data (Derry et al., 2010), we analyzed how some participants came to understand themselves as radical activists. While we have used our content-logging, coding, and analysis in other places to make sense of the learning dynamics of the campaign, here we pause to reflect on the significance of emotion on our analytic process and ask: How do the emotional configurations of analysts matter when we are investigating emotionally messy learning ecologies?

This paper contributes to ongoing work in the learning sciences to analyze when and how emotion shapes learning processes and how learning shapes the felt experience of emotion. While recent work has examined guided emotion participation (Vea, 2020b), the consequences of emotionality for learning in social movements (Curnow & Vea, 2020), and the specific ways that humor, sarcasm, snark, and rage create conditions for politicization (Curnow et al., 2020) and educational intimacy (Uttamchandani, 2020), this work has focused on participant learning. Our work builds from this space, but attends to how our emotionality as analysts (and as participants in the data) shaped how we made sense of and re-experienced the emotion of our data in the analytic process. To do so, we draw on feminist and Indigenous research methodologies which stress relational accountability (Hampton, 1995; Wilson, 2008) and standpoint epistemologies (Collins, 1982; Harding, 2004) alongside theories of emotion and affect (Hochschild, 1979).

We collected video data from weekly meetings, actions, and debriefs during the campaign, and across this data, the meetings became increasingly emotionally intense. Toward the end of data collection, meetings often included yelling, crying, storming out, and other emotional expressions. Participation in the meetings was difficult—as was content logging, coding, and analyzing the data in detail, because of the emotion that it re-generated. As we watched video-data, our team of analysts often ended up feeling extremely upset, with some of our team lying on the floor in despair, while others ate entire kilos of chocolate bars. Rather than assume that scholars enter the data as emotionless and disinvested, we reflect on how our process of sense-making about the learning that unfolded through contentious politics was entangled in reconstructed emotional configurations of the data in a way that was felt during the data collection, as well as the layered sensemaking and feeling that happened in our collaborative data analysis sessions.

This analysis is significant for the learning sciences in a few ways. First, it builds on work around emotion by bringing our methods of analysis into focus and acknowledging that as thinking and feeling people, analysts' experience of emotionality in the analysis process happens and is significant to how we make sense of our data. This is both a methodological intervention and a political intervention, which converges with other work in the learning sciences that has increasingly sought to disavow the notion that objectivity and neutrality are either possible or desirable for our work studying learning contexts (McKinney de Roysten & Sengupta-Irving, 2020). In acknowledging the ways that our emotionality shapes the sense we make of our data, and the way that the sense that is made shapes how we feel about the data, this meta-analysis draws attention to how emotion shapes learning not only in the contexts we analyze, but in the very ways we conduct analysis and make sense of our research data.

Nonviolence past and present: Learning with an emotional technology in transit

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Tracing nonviolence's political history from Mohandas Gandhi, through Dr. Martin Luther King, Jr. and the Black Civil Rights Movement in the United States, to contemporary uses in animal rights activism, this paper asks how

nonviolence supports particular emotional configurations in activist practice in socially and historically situated ways. Gandhi wrote in his autobiography, "Whereas a good deed should call forth approbation and a wicked deed disapprobation, the doer of the deed, whether good or wicked, always deserves respect or pity as the case may be" (Gandhi, 2012, p. 214). This idea was central to the practice of *ahimsa,* or nonviolence.

Writing about settler colonialism as a set of technologies, la paperson (2017) wrote, "Technologies are trafficked. Technologies generate patterns of social relationships to land. Technologies mutate, and so do these relationships" (p. 5). This paper takes as its starting point the idea that technologies also support the organization of emotional configurations (Vea, 2020b). An emotional configurations perspective treats emotion not as composed of universal states but rather of situated sociocultural phenomena (Lave & Wenger, 1991) embedded in complexes of social practice. Here, I examine nonviolent resistance, an emotional technology with many histories. I contend that nonviolence in fact names a set of relations between feeling, conceptual sense-making, and practice—in other words, an emotional configuration. Yet the patterns of relation that nonviolence generates are not identical across time and space. They mutate according to the particulars of their deployment, but they are always a matter of learning, of taking up particular ways of making meaning about emotion and what it is good for. From whence an emotional technology is trafficked itself becomes part of the relation.

This paper is part of a larger research project on learning in the context of animal rights activism (Vea, 2019, 2020a, 2020b). It presents empirical analysis of ethnographic fieldnotes and interviews (Emerson et al., 2011; Spradley, 1979). Thematic coding resulted in a focus on the social shaping of emotion and emotion's embeddedness in other forms of activist practice. The activists of Direct Action Everywhere (DxE), an animal rights network of activists based in the San Francisco Bay Area, used nonviolence trainings and narratives about nonviolence as part of their political project. I examine the situated nature of those uses. However, in line with the conference theme, I examine the history of nonviolence as an emotional technology for learning. Historicity becomes part of its meaning, and the contemporary context of use also shapes possibilities for learning and social change.

Nonviolence directs anger away from perpetrators of injustice toward the larger systems of injustice that are understood as the root cause. As Satoshi, a nonviolence specialist who led trainings for DxE explained during one such event at a network-wide conference in 2017, "Teaching people not to be angry is very dangerous." Martin Luther King, Jr. was "pissed off," he said. What matters is where the anger is directed. When we take anger out on people, he said, they tend to react, and conflict escalates. Instead, anger should take the form of indignation toward unjust conditions. Satoshi gave the example of the beating of Civil Rights protesters by police on the Edmond Pettis Bridge in Selma, Alabama, on Bloody Sunday in 1965. The violence they endured without seeking retribution awakened the conscience of the public and resulted in growing support. In this way, the acceptance of suffering was both philosophical and pragmatic. One accepts violence against oneself because the creation of just conditions requires that the injustice of violence not be propagated further, by turning it against one's adversaries. This moral demand also has strategic value, however, in that it inspires the sympathy of bystanders who may come to support one's cause.

In these ways, nonviolence in DxE encompassed not only the absence of violence but also the disciplining, or guiding, of emotions in practice so that the ideals of the Beloved Community—the social manifestation of justice—may emerge. As such, nonviolence was not simply the means for achieving justice. Nonviolence was a technology that structured relations of thinking, emoting, and acting (one might say "being") the manifestation of justice in the present. It was both the means and the ends. It was conceptually recursive, so that practicing justice is understood to make justice come to be. Interviews with DxE activists also showed how nonviolence was understood as a skill that required strengthening through repeated practice.

Historicizing nonviolence then adds complexity to these meanings. Explicitly and implicitly, DxE organizers' references to previous nonviolent movements—and especially the Black Civil Rights Movement—were used to give moral and political legitimacy to the movement for animal rights. But where previous movement actors used nonviolence in part to establish their own humanity in the face of injustice, DxE's more-than-human goals complicated the moral meanings of nonviolence. DxE activists, after all, were not fighting for their own humanization but rather for the moral standing of nonhuman others. Was it right to draw connections to the struggle for Black freedom? Further, the rise of European fascism and the dropping of the atomic bomb in Japan challenged Gandhi himself to reconsider whether nonviolence could be the universal solution to inhumanity he believed it to be (Devji, 2011).

For the learning sciences, this analysis provides an additional example of emotional configuration in the learning of social movement participants. Considering nonviolence as a kind of technology in transit clarifies the ways it structures the relations of meaning between feeling, conceptual sense-making, and practice. It also reiterates the importance of historical context for interpreting what emotional technologies for learning can do.

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Emotion, data and place: Children's emotions emergent in ecologists' practices of sampling and data visualization

Kathryn Lanouette, William & Mary

Within the learning sciences and science education fields, there has been a growing focus on engaging young people in the construction and critique of data to support expansive learning opportunities (Wilkerson & Polman, 2020). Yet to date, such work has rarely focused on the emotional dimensions of these abstracting and authoring practices, particularly with children. In this paper, I focus on 10-11year old children's emotional experiences as they engage in sampling and data aggregation practices within an ecology unit centered around their schoolyard. I ask, what emotions emerge as children engaged in these practices and how does this intertwining of emotion, data and place shape their engagement in the practices and their reasoning about socio-ecological systems?

This work draws from a larger design-based research project that supported elementary students learning about complex socio-ecological systems and data using participatory GIS maps (Lanouette, 2019). Across ten weeks, 5th grade students studied the soil ecology literally underfoot in their schoolyard, exploring the question of "Who can thrive here?" by sampling invertebrates and soil samples in their schoolyard as well as recording above-ground human activities to understand the relationship among all these dimensions of the system. This design involved children in selecting sampling sites to study in detail, gathering data they were interested in and joining together to conjecture and contest relationships in collaboratively constructed visualizations of their aggregated data.

Through a longitudinal comparative case study analysis (Yin, 2017), I examine two student pairs' emergent emotions as they engaged in and adapted the ecologists' practices supported across the curriculum. Data sources include (a) video of class activity in one-on-one, small group, and whole group contexts and (b) paper and digital artifacts (children's note sheets, data visualizations). Analysis focuses on children's emotion within sampling practices (planning sites, selecting sites, collecting data at sites) and collectively assembled visualizations of their aggregated data (constructing bar charts and two-way tables). In coding emotion, I examined verbal expressions using emotion laden words (both in the moment and in reflecting on past events), multi-modal expression of emotion (Jaber & Hammer, 2016), and paralinguistic markers of emotion. By contrasting two pairs over time, I aim to illuminate not only the heterogeneity of emotions emergent within this design but also how children's emotions shaped how they selected schoolyard sampling sites, how they participated in collective constructions of their aggregated data and how they considered relationships within complex systems.

Several findings are noted here. Children's emergent emotions varied widely, ranging from delight and "love" of a schoolyard site to competition and exasperation, in turn shaping varying approaches to selecting sampling sites and representing data. For Amir and Marie, their joy in finding animals of any kind along with physically being in their favorite tucked away spot that Marie "just loves!" led the pair to repeat sampling at their site to see how the system might change over time (a key idea in ecologists' sampling practice) and to consider multiple interrelationships in the socio-ecological system. As they built a two-way data table with classmates showing all the invertebrate species discovered, their excitement for a mysterious animal they saw led them to insisting on showing it in the data, even though it was hard to categorize. In contrast, for Elena and Max, their focus on finding the most animals led them to constantly switch sampling sites that would ensure the highest counts. These feelings of competition emerged again as they were collectively building bar charts of earthworms counts, where the pair falsely elevated their data to ensure they had the highest earthworm counts among their peers.

Implications are twofold. First, these findings point to the import of attuning to the wide range of emotions emergent in constructing and contesting data, elevating not only children's warm emotions towards local places and more-than-human organisms within but also children's sharper emotions such as competition and exasperation. Given the larger norms, ideologies and power structures that shape emotional experience and expression (Vea, 2020b), this work suggests the import of making visible broader expressions in children's science pursuits as work in emotion, data and science practices continues. Second, these findings call for existing work in design-based research to more deliberately center children's emotions in the design of activities, the articulation of conjectures (Sandoval, 2014) and the study of learning processes.

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Teacher learning in science labs: Affordances and constraints of emotional display rules

Shannon G. Davidson, Lama Z. Jaber, and Sherry A. Southerland, Florida State University

Science as a discipline has long been perceived as objective and, in turn, scientists have often been characterized as unfeeling or emotionless in relation to their work (Burbules & Linn, 1991). However, work of historians and sociologists of science and science education researchers provide ample evidence that affect is inherent in the doing of science (for examples, see Jaber & Hammer, 2016; Robbins, 1999) and that science is a social endeavor wherein emotional configurations (Vea, 2020b) are inherent. This affective dimension of science is not only part and parcel to professional science but central to the experiences of science learners. In order to support students' disciplinary engagement in science, teachers must understand and have facility with not only the conceptual and epistemic components of science, but also with the emotions that are part of disciplinary engagement (Davidson et al., 2020; Jaber et al., 2018). One context that aims to develop teachers' disciplinary understandings of and facility with science is that of Research Experiences for Teachers (RET) programs, in which K-12 teachers are immersed in extensive scientific research through work with scientists (Dixon & Wilke, 2007; SRI International, 2007). Although RET may provide teachers with firsthand emotional experiences in the doing of science (Davidson et al., 2020), teachers may not recognize these emotions as inherent to the discipline. Indeed, it is unclear whether RETs provide teachers a full grasp of science as a discipline, particularly with respect to recognizing the emotions that *scientists* experience in their work. To this end, our work considers the following question: What messages may be imparted to teachers about the role of emotion as an inherent dimension to the discipline of science through their encounters with scientists during an immersive research experience?

In this work, we argue that tacit yet influential emotional display rules (Diefendorff et al., 2006; Hochschild, 2012) may limit teachers' access to scientists' emotional experiences. Such rules shape how affect is or is not displayed in lab spaces, conveying meta-messages for teachers about what feelings and emotions are legitimate and acceptable in the doing of science. In turn, these tacit messages may actively shape the ways in which teachers come to develop their own attunement towards their emotional experiences in science and subsequently their students' emotions in the science classroom. To illustrate these dynamics and to explore the potential ways in which emotional display rules may moderate teachers' understanding of the affective dimension of science, we offer the example of Ava—a teacher participating in a six-week summer RET program at a national laboratory—and Dr. Ji, her mentor scientist. During one of the experimental cycles of Ava's research, there was a miscommunication of scheduling and a facility-wide routine power outage interfered with an overnight experimental trial that Ava and Dr. Ji were conducting. In reflecting on this moment in an interview, Ava noted:

> I felt really frustrated and upset when the furnace must have shut down during our trial run, -- like what do we do? How can we fix this and run it again? But [Dr. Ji] was like 'No no no don't worry. This happens. This is part of it--part of, you know, science.' He didn't make me feel bad, but [rather] it's just part of science.

In this example, Dr. Ji makes moves to support Ava by normalizing the error as 'just part of science' and by telling her not to worry. In addition, as evidenced from field notes, Dr. Ji went on to tell Ava an anecdote of how this exact situation had happened to him once before when he was new to the lab. He described how he was 'confused' but once he'd realized the mistake he 'had to laugh and start over.' While Dr. Ji did make moves to support Ava by normalizing error and offering commiseration through the anecdote, he did not explicitly acknowledge Ava's frustration. Instead, his moves subdued those feelings. Additionally, Dr. Ji did not himself demonstrate any emotional reaction to this setback.

In light of these reactions from Dr. Ji, it is possible that Ava could walk away from this encounter with the understanding that scientists somehow lack emotion within their work or do not experience affect within the doing of science. Evidence for this internalization can be found in the observation that for most of the RET teachers, their own displays of emotions within lab spaces were very restrained and limited. Instead, these emotions (frustrations, vexations, excitements, and insecurities) were only expressed in other spaces (lunch times or social events) with fellow RET participants. This suggests that RET teachers may implicitly come to view their own emotions as somehow 'other' or unacceptable in science.

Emotional display rules related to science spaces have the potential to reinforce positivist views (Burbules & Linn, 1991) that science is an objective discipline which strips science—and those who do science—of their humanity. If teachers walk away from encounters with scientists that paint doers of science as emotionless,

they may unintentionally reinforce this erroneous and stereotypical narrative in their classrooms, reproducing marginalizing ideas of who feels welcome in science and science spaces.

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