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ORIGINAL PAPER

Becoming alive within science education (research): thinking with life history(ies), bodies and stickiness

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Abstract

In life history methodologies, 'human' lives appear to take primacy over other lives. Within science education literature, life history methods often are approached as reflective tools to make meaning out of teachers' pedagogical practices and commitments. In the present research, we tinker with life history research, to follow its performative work in (re-)producing what counts as life, nature, science and science education. Thinking with life history(ies), bodies and stickiness, we analyze a college instructor's (Nurul) life with others. Nurul is committed to a science pedagogical approach ('STEPWISE') centered on STSE education for social and environmental justice. This paper relays what was (re-) produced when Nurul's life narrative, and our own encounters with life history methodologies were plugged into one another. Analytically, we discuss stickiness of humanist and meaning-making practices in life history methodologies and how this might have enabled/complicated our analyses of Nurul's life history. We invite further analyses into *productive aspects* of life history(ies) and how they might gesture to pedagogical possibilities for being/living differently within nature, science and science education.

Keywords Life history · Affective economies · Stickiness · Nature · Embodiment · STSE education

> There is an urgent need to supplement the familiar repertoire of humanist methods that rely on generating talk and text with experimental practices that amplify other sensory, bodily and affective registers and extend the company and modality of what constitutes a research subject (Whatmore 2006, pp. 606–607).

The impetus of this inquiry is to "amplify sensory, bodily and affective registers" in life history methodologies that are known to privilege talk and human interpretation (Cary 1999).

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When engaging life history methodologies, our attention may turn to the 'human' whose life is told, complicating efforts to "extend the company and modality of what constitutes a research subject," and in a way limiting opportunities for storying life history(ies) otherwise.

Our research embodies such methodological and theoretical dilemmas, noting "stickiness" (Ahmed 2004) of humanist and meaning-making practices in representations of lives. We, initially, sought to explore life history of 'Nurul,' a college instructor and third author, as *reflective* of his commitments to a pedagogical approach centered on critical and activist STSE education, STEPWISE (Bencze 2017). Nurul gave meanings to his practices by evoking his past experiences with nature. Our research subject, at that time, appeared to be distinctively, 'Nurul.' As for nature, it was reduced to a series of meanings that enabled Nurul to justify his practices. A sense of dissatisfaction grew out of those initial encounters with Nurul's life history as well as some of the assumptions that seemed to ground our engagement with life history as a methodology.

This paper relays what was (re-)produced when Nurul's life narrative and our own encounters with life history methodologies were "plugged into" (Jackson and Mazzei 2013) one another. At the outset, then, is recognition of our inabilities to detach ourselves as researchers from our object of study; we could only re-tell Nurul's life through our own and collective embodied lives.

While storying one's life experiences is likely to be imbued with strong emotions (e.g., emotional ties to nature), limited research examines how life history not only reflects emotional experiences but may "*produce* new affective and embodied *connections*" (Zembylas 2007a, p. 19, *emphasis in original)*. We are keen on exploring productive aspects of life history(ies) and how they might gesture to pedagogical possibilities for being/living differently within nature, science and science education.

This paper is organized into major parts. First, we dive into various dilemmas and how they troubled our initial analysis, pushing us into "thinking with" (Jackson and Mazzei 2012) life histor(ies), bodies and stickiness. "Thinking with" can possibly help us to "stutter, slow, or stop with regard to taken-for-granted and received meanings and matters" (Higgins, Wallace, and Bazzul 2019, p. 160). Throughout this paper, we remain particularly attuned to affective economies (Ahmed 2004) of life history research and how they might stick us-Nurul to particular ways of thinking–being–relating to data, lives, nature, science and science education. Simultaneously, we attempt to perform some blockages in those affective economies by revisiting earlier analysis and storying Nurul's life with others differently. This paper, then, stories those onto-epistemic movements toward and away from being–living with nature, science, science education and premises of life history research, propelled by an overarching wondering into what it might mean to become alive in one's pedagogy and one's research.

Thinking with life history(ies)

Thinking with life history(ies) is an invitation to think with lives, with what exists and could exist; yet, at times, made lifeless. For some time, those ontologies of existence have been contained in *human* lives. In defining life history approaches, Ardra Cole and Gary Knowles (2001, p. 11) write: "In as much as it is *humanly* possible, life history inquiry is about gaining insights into the broader *human* condition by coming to know and understand the experiences of other *humans*" (*emphasis added*). Stressing a similar point, Cary (1999) suggests that narrative forms of research have been generally grounded in humanist

epistemological assumptions that authorize meaning making of humans as reflective of social, cultural and political realities. Rubby Dhunpath (2000, p. 544) writes: "I want to suggest boldly, therefore, that the life history approach is probably the only authentic means of understanding how motives and practices reflect the intimate intersection of institutional and individual experience in the postmodern world." While we do acknowledge that lives told are 'molded' in larger social, cultural, political contexts (e.g., Chinn 2002), we remain skeptical about life history research's claims for authenticity in reflecting realities. Biographical and phenomenological accounts of one's own history, not only efface other (hi)stories, but they idealize voice and authenticity (Lather, Jackson and Mazzei 2009), giving illusions of an all-knowing, rational and consistent subject, able to give a full account of their life.

As collaborators on this work, we often hear ourselves speaking of Nurul's life history in terms suggesting that 'his' life is all that mattered. Consequently, we wondered how 'human' life history may usurp rights of other 'non-humans' others to come to life. Humans have often associated life with animacy, even though current science acknowledges that so-called non-humans belong to realm of the living. However, it seems that anything that remain imperceptible to humans as movement—within human-centric temporal periods of interaction—turns to an inanimate, almost lifeless object, without consideration for its own temporal scale (Chaudhury 2019). In her efforts to "make time for soil," Maria Puig de la Bellacasa (2015), a feminist scholar within fields of Science and Technology Studies (STS), remarks how human-centric timescales and their ensuing interests in productivity of soils marginalize other forms of temporalities that enable different forms of soil care. Human-centric timescales grounded in technoscientific inventions maintain soil as a resource rather than a vibrant living community. She argues that "what soil is thought to be affects the ways in which we care for it, and vice versa" (p. 692). Borrowing similar terms, one might say that what *life* is thought to be affects ways we care for it, and vice versa. Springgay and Truman (2017) give us a way of musing about rocks not as "immutable or passive" but "agential and vital" (p. 852) to center movement matter as existing in all things. This line of work stresses values of attending to different temporalities in a more-than-human world, as we forge different "ethico-political" (de la Bellacasa 2011) attunements to what is animate–inanimate, living–nonliving.

Another significant point to our discussion in this section is that while life history methodologies often suggest a reflective stance on one's life, they often fall short of recognizing how such reflective accounts come to *perform* one's life with others. Etienne Wenger's knowledge duality theory and his proposed dialectics between world and sign (see also Roth 2001) may be useful to our argument here. The life history as it is lived in the moment and as it is unraveled in the moment could be equated to the world (or the 'real'), whereas the narrator's/researcher's re-telling one's life experiences could be the sign (a representation of what is 'real,' what was once lived). Understandably, the sign is never lost in the real, nor the real/material is ever absent in the sign (Lemke 2015). Phenomenologically speaking, we recognize that meaning-making practices are always already embodied/material because of our in being with the world and with our participants (Hwang and Roth 2011). Similarly, our material engagement with the world seems to be always already dependent on our shared sign systems and how we take up or not shared meanings (Tan and Barton 2008). Having said that, reflective accounts in life history methodologies appear restricted to translations from the world to the sign, privileging meaning-making practices, with perhaps less attention to the opposite translation, whereby the sign comes to equally *perform* (and not merely reflect) the (material) world. Thinking with life history(ies) offers us a way of attending to materiality of (more-than-human) lives.

Narrative forms of research have often attended to how recounting can take many forms depending on audience, expectations, contexts that frame telling (see, for example, Maclean 1988). Those are not just mere background elements that influence telling/reflections phenomenologically speaking, but their entanglements with acts of storying produce worlds, realities and subjects. When Nurul recounted his life history in relation to his experiences with nature, at times, nature appeared like a brute entity, brought to life through human (meaning making) practices. This reflective tendency to think *about* nature, rather than with nature (Wallace, Higgins and Bazzul 2018), could help maintain a view of nature as a resource that comes to life 'only' through human meaning-making practices, perhaps re-inscribing a hierarchical distinction between what is nature and what is human.

Thinking with bodies

The title of this section is likely to carry double connotations: (1) Thinking is never immaterial, it is always linked to a body; we need a body to think with and (2) Thinking with bodies is an invitation to extend how we come to relate to bodies (beyond the bounded human body, see Alsop 2011). While it is generally recognized that thinking (simplistically understood as a cognitive function of the brain) needs a body, we remain cautious not to espouse this first meaning as it seems to operate from a long-standing Cartesian tradition, plaguing science education, whereby mind and body, are maintained as separate (Alsop 2005). Instead, we locate our discussion in the second meaning.

In further clarifying our understandings of body and embodiment, we can't avoid addressing how the body has been theorized in relation to two broader constructs: emotions/affect (and their associated bodily connections) and cognition. Some have perceived the body as biological and/or social or as needing to transcend biological and social dichotomies (Lupton 1998).

Fields of neurophysiology and psychology often explained emotions in terms of physiological bodily arousal. In that instance, the body serves as an object, a container of biological and physiological changes, as per studies of facial expressions to determine emotional states (Ekman 1993). Others argued that bodily and physiological responses precede (rather than coincide with) emotions. In other words, humans feel a bodily sensation, evaluate it cognitively and assign to it an emotion label (Folkman and Lazarus 1988). In those instances, the body is defined as a mere vehicle for emotions, reactive and biological.

Studies in semiotics (Kress 2009) and embodied cognition (Colombetti 2013) have recognized irreducibility of reasoning to disembodied thought. According to existential phenomenologist Maurice Merleau-Ponty, embodiment is inextricably connected to perception; our bodies give meanings to our lived experiences. "The 'flesh of the body' is made of the same flesh of the world, and this is precisely why we experience the world" (cited in Zembylas 2007a, p. 21). The "flesh of the body" corresponds to a view of the body as a "sentient and sensible being" (Merleau-Ponty cited in Crossley 1995); as that which "sees and can be seen, hears and can be heard, touches and can be touched" (p. 46). For Merleau-Ponty, the reciprocity by which the body encounters the world delineates the body as a site of knowledge and perception (Crossley 1995).

Postmodern understandings of the body suggest that the body does not only perceive the world as part of an integral self but performs and is performed by the world (Zembylas 2007a). The body is performative in that it acts not only as a site of knowledge (or perception) but also as a site of becoming (Micciche 2007). Jackson and Mazzei (2012) argued that some

post-structuralist accounts didn't fully engage materiality of bodies, which, in some instances, remained subsumed under discourses and discursive practices. Consequently, new materialists and post-qualitative researchers sought to give matter a voice (Mazzei and Jackson 2017) and advanced a view of performativity to encompass all that is bodied (beyond human–non-human dichotomies) (Manning 2014). Gilles Deleuze (1988) builds on seventeenth century philosopher Baruch Spinoza's view of the body as that which "affects and is affected." The body is no longer defined by its form, organs and functions but by "the affects of which it is capable" (p. 124). Bodies and meanings "intra-act" (Barad 2003), in the sense that they are ontologically equivalent; one does not precede the other; they come into being *with* one another. Thus, the body is not a container for human emotions (in psychological accounts), nor least a basis of human perception (in phenomenological accounts), nor is it merely a discursive product (in some post-structuralist/socio-constructivist accounts). Rather, bodies are performative, constantly delineated through encounters with other bodies, as products of affects' circulation (Massumi 2015). For Latour (2005, p. 205), "to have a body is to learn to be affected, meaning 'effectuated,' moved, put into motion by other entities, humans or non-humans."

Erin Manning (2014, p. 163) argues: "There is never a body as such: what we know are edgings and contourings, forces and intensities: a body is its movement." Ingold (2011) argues that lives do not unfold *in* places, but "through, around, to and from them, from and to places elsewhere" (p. 148). He coins the term *wayfaring* to describe "the embodied experience of the wayfarer" (p. 148), "threading his [sic] way *through* the world rather than routing it *across* it from point to point" (p. 151). He moves on to distinguish between space and place, occupying and inhabiting, transporting and wayfaring whereby the first term in each of those pairs presupposes a demarcation between inside/outside, in comparison with the second term, which recognizes ontological co-constitution of selves, places, objects and discourses (Latour 2005).

This prompts us to think about recounting Nurul's life history not in terms of the places his body came to *occupy* (to reside in), but rather in terms of *wayfaring*, of lines along which he inhabited various places only to move through others. This theoretical move is important in light of our attempts to come to terms with our axiological/theoretical commitments not to re-inscribe a humanistic attitude that privileges bodies occupying/residing in places, as if bodies are demarcated from their surroundings. Thus, we sought Nurul's movements not *in* places, as if Nurul is pre-constituted by them, but Nurul as *his* movement, performing himself endlessly in the process (Ingold 2011).

Thinking with bodies, hence, pushes us to reconcile a view of the body not as a vehicle for the mind but rather as that which comes into existence from its encounters with other bodies (humans, non-humans). Materiality, thus understood, is emerging (Barad 2003); it is what comes to matter (and matter less) through acts of storying and bringing bodies-meanings together and away from each other. Thinking with bodies affords ways to interrogate assumed demarcations of bodies, as an ontological move toward increased social and ecological justice through science education (Martusewicz, Lupinacci and Schnakenberg 2010).

Thinking with stickiness

Feminist and cultural theorist Sara Ahmed (2004) employs notions of stickiness to refer to "accumulation of affective value" as part of affective economies "that generates attachments to others, to world-views and to a whole array of sources and objects" (Micciche 2007, p. 1). In affective economies, emotions do not reside in any 'body.' Rather, emotions are likened to a form of capital that increases in affective value with continuous movements

among bodies and their meanings. In analyzing public texts and discourses that reinforce notions of nation, Whiteness, others (e.g., refugees, immigrants, indigenous), Ahmed (2004) notes how emotions such as hate, anger, shame, disgust are not 'objects' to be singled out in those texts but that those emotions are processes, subliminal forces and intensities that bind and separate bodies by sticking them to certain ideas, objects and discourses (and not others). In our study, we examine how Nurul's life history accumulated affective value, as ideas, discourses and bodies (body understood here from post-humanist traditions as performative that "which affects and is affected") gained currency through their circulation in acts of telling, re-telling and coming to know with Nurul.

Life history methodologies have their own affective economies. In our case, there appeared to be something deeply comforting and satisfying in making sense of Nurul's present pedagogical practices in light of his past experiences. It felt 'good' to organize his life in linear and coherent ways to reveal 'hidden' aspects that brought meanings into his present practices. Those emotions worked on us to orient us in particular ways (and not others) (Ahmed 2010). They oriented us as (human) bodies (i.e., authors/collaborators) to 'know' lives of other (human) bodies (i.e., Nurul). In the process and almost immediately, nature (as it figured in Nurul's narratives) turned into a theme. Nature became the non-human. Nurul's life lured us into putting order and making meaning out of what appeared random and in need of an explanation (e.g., his commitments to a pedagogical approach in the context of a structured and overly determined college education). Those affective economies even oriented us to recount lives according to fixed places and times. The chronological progression in time and place of lives is equally predictable and "comforting" (Ahmed 2019). There is almost a 'naturalness' (one might argue this is not the right word) to such affective orientations that make them hard to resist, that make them sticky.

Ahmed (2004, p. 91) writes: "Some forms of stickiness are about holding things together. Some are about blockages or stopping things moving." Affective economies of life history methodologies worked on us to hold our attachments to humanist, anthropogenic, linear and phenomenological forms of analyses. Thinking with life history(ies), bodies and stickiness afforded some blockages in those earlier analyses. Analytically, we found ourselves always in the middle (Aoki 1993); comforted in our efforts to organize 'Nurul's life' into a coherent and meaningful story while feeling troubled by those very claims. Alecia Jackson (2013) invites us to re-think the conventional biographical question of: "how do we accurately represent being?" into "how does being [widely understood] *become* in the act of representation?" (p. 114, *emphasis in original*).

Coming to know with Nurul

Nurul is a sessional instructor at a community college located in the Greater Toronto Area, Canada. He had recently immigrated from India. For the past 3 years, he has been teaching courses in an industrial microbiology program. This two-year program is designed to provide college students with knowledges and skills needed to join a workforce of biotechnicians. Specifically, students are trained to acquire skills that will allow them to work as "bench technicians in pharmaceutical and food industries" (as advertised on the college website). Thus, emphases are placed on acquisition of practical and technical skills (e.g., microbial plating, counting, identifying microorganisms in different water samples, testing effectiveness of antibiotics on specific microorganisms) often at expense of realizing implications of science and technology applications on societies and environments.

Amidst those "socio-political silences" (Gough 2015), Nurul's pedagogical orientations toward STEPWISE approaches may be perceived as unconventional in this context. STEPWISE, stands for Science and Technology Education Promoting Wellbeing for Individuals, Societies and Environments (Bencze 2017). As a pedagogical approach, it develops capacities for students to revisit their relationships with their world (El Halwany, Zouda, Pouliot and Bencze (2020)), through critical examination of science and technology products and through engaging in forms of activism for social and environmental justice. STEPWISE may be situated within socio-ecojustice current relative to STSE education (Pedretti and Nazir 2011). Against backgrounds of college science courses, STEPWISE was often received by students with a renewed sense of interest in science. Nurul's students would often comment how "they never studied social and environmental connections of science and technology in their previous courses at the college" and how this learning experience was "new" to them.

This research was part of a year-long action research project (Noffke and Somekh 2009) with Nurul, who has been actively implementing lessons and activities around the STEPWISE pedagogical framework. As probably implied by now, the present research does not extend to Nurul's actual practices with STEPWISE nor to his students' direct experiences with this framework. Instead, this life history project materialized following our past engagements with Nurul while teaching at the college. These past engagement afforded some "thickness" to our analyses (Denzin 1989) and to how we came to encounter Nurul's life history.

This inquiry draws from various data sources that include: a 3-hour life history interview with him (Goodson and Sikes 2001) followed by written reflections on his life history in relation to courses that he was teaching at the college (e.g., physics for food science technology, microbiology projects), Nurul's reflective journal that he maintained throughout a semester of teaching at the college using STEPWISE approaches, weekly audio-recorded meetings that primarily involved Nurul, Larry and Sarah and that resulted in further reflections on his life history and his practices and lastly, informal discussions and email correspondences asking for clarifications related to his own written and other transcribed reflections.

Initially, Sarah and Larry (first two authors) met to entertain potential research proposals that would involve all current collaborators and who have been previously involved in an action research project around Nurul's uses of STEPWISE in his microbiology laboratory courses (Schaffer, Milanovic, El Halwany, Hassan, Zouda and Bencze 2017). Yet, this time around, we didn't have direct access to Nurul's teaching context (because of various logistical limitations) and, thus, our interest in studying Nurul's life history appeared—at least partly—to embody our current preoccupations, what was and was not materially available to us. While visiting Nurul's teaching context was not possible, Nurul often came to us, to Larry's office at OISE.[1] The mundanity of those early material encounters translated into a research project whose more potent purpose became to know Nurul's life history in relation to his practice.

As part of a 3-hour life history interview between Sarah (first author here) and Nurul, Sarah began by describing and detailing aspects of her own life history, making sure to situate life events in social, political and cultural contexts, as recommended for life history

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research and timeline interviews (Adriansen 2012). Those created openings for Nurul to begin to talk about his life history. Given extents of details he provided, we could tell that Nurul was willingly sharing aspects of his life history. The mutual telling allowed us to juxtapose similar aspects and practices in Nurul and Sarah's respective cultures (India and Lebanon, respectively), around gender roles, family expectations, religious and cultural norms, schooling and our experiences with science education. At various points during our life history interview, Sarah expressed "emotional understanding" (Denzin 2003) of Nurul's reflections on certain aspects of his life history that she has personally experienced as part of her own life history. In other words, some meanings could be viscerally experienced, marking the contours of her own gendered, non-White, immigrant body.

After introducing him to purposes of the study, Nurul reconstructed his life history, highlighting pivotal moments in his life (e.g., his science education in India, his teaching experiences in various parts of the world, and his learning/teaching experiences in Canada). It's important to point out that Nurul himself shares a similar trajectory as the students he teaches in the college. He identifies with some of his students' cultural backgrounds (India). Before he became an instructor at the college, he also graduated from biotechnology program from that same college. He was a graduate student in one of the teacher education courses taught by Larry (second author), during which he was introduced to the STEPWISE pedagogical framework. Kristen, Minja, Sarah, Majd and Larry further facilitated an action research project with Nurul as he infused his microbiology laboratory courses with STEPWISE approaches (Schaffer et al. 2017). Recently, Nurul started his PhD in education, as a part-time student (and alongside other collaborators on this paper), while still teaching at the college and continuing to implement STEPWISE in his practices. Sarah observed Nurul's classes as part of her dissertation work. Thus, Nurul is uniquely positioned in various entanglements that he has with places and individuals that constituted aspects of his life history. Those entanglements make it even more difficult to think of Nurul's life history as a mere object of our study. Instead, we came to know *with* Nurul as a companion among others.

Moving within data (analyses)

Because we are seeking hybrid conceptions of bodies (including bodies of data), we can't merely think *about* our data, but also *with* our data. In a sense, our analytical approaches might be seen as embodying an onto/epistemic movement *"within and against interpretivism"* (Jackson and Mazzei 2013, p. 261).

At various times, we were confronted with stickiness of a thematic reading of Nurul's life history. We hurried to search for analytical and theoretical frameworks that would help us fit our inert data into meaningful categories. Our approaches to those frameworks complicated our efforts to think beyond meaning-making practices (and their reflective stances) while at the same time, they created openings for thinking–being differently within data-nature-science (education).

It is important to acknowledge that Nurul's depictions of his relationships to nature and his early life experiences were collectively told/crafted. Indeed, while Nurul alluded to his relationships to nature in his initial life history interview, we, as research collaborators, became particularly interested in learning more about his experiences with nature as a result of reviewing the literature and coming across the work of Teresa Shume (2017), among others. In our subsequent meetings with Nurul, we purposefully turned his attention

to Shume's (2017) framework on "human relationships to nature," asking him to further reflect on his relationships to nature. Since he could not recount in detail his early experiences as a child in rural India, it later came to our attention that Nurul had been in contact with family members still living in India to "ask for more details" (oral communication with him) about this period of his life. Ultimately, his written reflections about those early experiences were possible as distant and close bodies and memories were collectively mobilized to *perform* those relationships to nature. We think it is important to acknowledge those events in order to draw attention to complicities and affectivities that brought us in contact with Nurul's life and to insist on material (and ultimately value-laden) nature of our encounters with his life history. Nurul's representations of his life history were never really 'his' own and his life history unraveled itself to us 'as such' because of his bodily insertion with others in a distant time (his parents in India) and his bodily insertion with us as collaborators and colleagues in the program. Thus, 'his' representations were immanently performative drawing a landscape in which we all participated in continuously constituting his ways of knowing, being and valuing nature, science and science education.

As we hurried to make sense of Nurul's life history, we found solace in Shume's framework especially after noting a repetitive reference to nature in Nurul's storying of lives. In her adapted framework, Shume identifies variation in human-nature relationships along four dimensions: technocentrism (us over nature), egocentrism (us vs. nature), ecocentrism (us in nature), resiliocentrism (us within nature). Those dimensions are informed by relative intersections among ontological (from a reductionist to a holistic view of nature), epistemological (from pragmatic to idealistic interactions with nature) and axiological continua (from anthropocentric to biocentric value-based judgments about nature). For instance, egocentric orientations reduce nature to a 'machine' that produces consumable resources to satisfy human needs, often at expense of non-human needs.

Those categories attracted us. They appeared convenient, easy to work with, distinctively distinct (acknowledging Shume's argument that they are better seen on a continuum). Our own approaches to this framework rested on practices of associating and labeling excerpts of data from Nurul's life experiences according to those four identified dimensions. It seemed the 'right' and most evident approach, from our side at least. We were comforted by the apparent straightforward-ness of the task and felt attached to practices of labeling which supposedly legitimized our research, grounded it, made it strong, gave it meaning. We were haunted by a search for meanings. Labels, themes, codes organize, smooth out inconsistencies (MacLure 2017). They could be comforting to our eyes, ears and imaginaries. They circulated in affective economies of 'good' research practices.

As themes on bodies and embodiment started to take form, we took refuge in words from Csordas, who called for "a methodological attitude that demands attention to bodiliness even in purely verbal data such as written text or oral interview" (Csordas 1999, p. 148). Our approaches to this methodological attitude (compounded by a missed opportunity to question what "purely verbal data" might mean) led us into concluding that life history research enabled Nurul to reflect on his *embodied* connections to nature, others and science education. We believed this to be an important insight given paucity of research on bodies, affects and emotions in (science) education (Zembylas 2007a). Yet, embodiment, thus understood, remained within a bounded body (including bodies of "purely verbal data"). Notions of embodiment were once again phenomenological as we hurried to uncover how (human) bodies 'are' represented through verbal transcripts. At that time, such notions of embodiment appeared to matter for our research and perhaps what mattered less was an inquiry into ways more-than-human bodies 'become' through acts of representations.

Perhaps extending to a sticky thematic reading, we noted our propensity to jump to hasty conclusions, to close off potentials within data. We hurried to make sense of Nurul's embodied connections to nature, science and science education, to determine what those embodied connections might *mean* to his current practices. In our attempts to move away from such reflective stances, we remarked how we might have conflated notions of performativity with justification. We heard ourselves saying that Nurul *performed* his current practices by evoking his embodied relationships to nature, others and science education. Yet, we treated performativity as a mere confirmatory (reflective?) tool that made Nurul's commitments to his practices preexist what we came to 'discover' later on through our inquiry (Zembylas 2007a). Our analysis of (post-human) performativity seemed to always fall short from attending to the *doing* of life history (research).

As we slowly absorbed uneasy stickiness of biographical approaches that came to incessantly (Ahmed 2004) on our approaches to life history research, we began exploring other analytical venues. Fenwick, Edwards and Sawchuk's (2015) call for "tracing the sociomaterial" in educational research appeared particularly promising. Specifically, we sought ways to become attuned to social and material arrangements in Nurul's life history that "make visible the mundanity of everyday life" (p. vii) in carrying effects. Furthermore, we became specifically intrigued by research-creation practices (Manning 2015) that seek to generate new forms of experiences, bringing together what "often seem like disparate practices, giving them a conduit for collective expression" (p. 53). Non-representational methodologies (Vannini 2015) and relational materialism (Latour 2005) constantly brought into our purview ways to think of "life [as] movement (…) a viscous becoming in time–space" (Vannini 2015, p. 3). In developing an argument around possible contributions of non-presentational theories (NRTs) to education, Zembylas (2017) summarizes one of NRT's tenets as "recognizing the vitality of life" (p. 397). This invites attunements to "complexity, unpredictability and indeterminacy of things in the world as opposed to the lenses of rational behavior, causation, instrumental reasoning and mechanistic predictability" (p. 397). Non-representational theories "redirect attention from the posited meanings of representations towards the materiality of things in which everything co-exists on the same 'plane of immanence'" (Deleuze and Guattari, cited in Manning 2015, p. 395). Non-representational methodologies do not set themselves in opposition to representational research, "but they pursue it in parallel with differentiation" (Vannini 2015, p. 7). Such differentiation may exist in very acts of research creation, characterized by a "marked attention to events and the new potentialities for being, doing and thinking that events may bring forth" (Anderson and Harrison 2010, p. 19).

Movements of inquiry

This section is subdivided into three subsections that follow Nurul's life with others in ways that (re-)produce (new) potentialities for being within nature, science and science education. In each subsection, phenomenological/thematic accounts of Nurul's life history are presented in parallel with posthuman/materialist analyses as we strive to think with life history(ies), bodies and stickiness. In moving between those two levels of analyses, we seek to embody continuities and discontinuities between modes of thinking *about* data and *with* data, building on dilemmas presented earlier in this paper.

This move into and out of phenomenological accounts of life history is further entangled with Nurul's own accounts moving into and out of certain (natural) landscapes when storying his life with others.

Within nature

Nurul gave meanings to his commitments to STSE issues by referring to his relationships to nature as a child growing in a rural town in India, 'Malyal.' In re-telling his early childhood experiences, his descriptions came to be saturated with olfactory, auditory, gustatory and tactile re-encounters with nature. Speaking of his emotional attachments to nature as a child roaming the forest, he said: "I felt a kind of emotional connection with that wilderness. Even to this day, I remember that delicious smell of fresh foliage." Those embodied reflections allowed Nurul to relive visceral sensations and were situated in his discussions of his own personal values of temperance, harmony and sustainability with nature. Such values were embedded in an ecocentric worldview (us in nature) when he says: "Like all other people in the village, my family and I knew that we are deeply embedded in nature and that our very survival depended on nature's generosity." Those ecocentric relationships to nature might even have allowed him and other villagers to witness and experience *beauty* in nature: "We heard so many first-hand experiences of villagers that happen to watch a peacock dancing in the forest when it rains."

A thematic reference to ecocentric relationships to nature supposedly translate into humans feeling captivated by 'it.' Sensuous and emotional connections to nature within ecocentric relationships seem to maintain nature as that which is demarcated from that which is human. Within those demarcations, the ability to live in harmony and temperance with nature, maintains nature as that which is lived *with*, possibly as the "other" (Hoeg 2016). To "experience beauty in nature" is phenomenologically articulated, centering the human eye. Aesthetic experiences with nature circulate in affective economies that maintain nature as a human experience. In here, those affective economies produce nature as beautiful, sensuous and romanticized. "A peacock dancing" further attests to anthropomorphizing what is simultaneously produced as non-human, a peacock. From a phenomenological account, the dancing is 'in' the peacock, 'in' a body. Re-reading this segment "We heard so many first-hand experiences of villagers that happen to watch a peacock dancing in the forest when it rains," we felt inclined to offer an alternative account that extends notions of embodiment to all that is bodied (Manning 2010). We playfully tinkered with this aesthetic scene so that "hearing," "watching," "villagers," "forest," "rain," "peacock" and "us" collaborators are now all *doing* the dancing. The dancing seems to embody all of those other bodies and sensibilities, pushing us to ask: Who is dancing? Who is becoming beauty? Who is moved by who?

Amidst his re-telling of those early experiences, we also encountered instances whereby Nurul's relationships to nature could be more characterized as technocentric (us over nature), when he and his friend would playfully engage in tricking nature: "Sometimes we felt bad for cheating mother hen by including other species' eggs in its clutch of eggs for it to incubate." Yet, Nurul acknowledges that "they felt bad for cheating mother hen." This could be an insight into complexities of one's relationships with nature, as it is fluid and interchanging, hence, Shume's (2017)) depiction of those relationships on a continuum.

Feelings of guilt toward the 'non-human' living other calls our attention; "feeling bad for cheating mother hen" extends emotions to the hen, who *feels* cheated on, thus

causing Nurul and his friend to "feel bad." Yet, at the risk of re-inscribing human-hen divisions, we are invited, through this playful scene that involves incubating the 'wrong' eggs under mother hen, into considering naturalized and normalized meanings of motherhood. Here, feelings of guilt circulate in affective economies, articulated at points of contact (Ahmed 2004) further sticking young bodies to what is normal/natural mothering and what is not. In turn, this emotional sensibility of guilt might be pregnant with pedagogical possibilities for being–feeling–relating differently with others.

Embodied relationships with nature were also visible as we followed Nurul's movements as a child playing with other kids in Malyal. His childhood adventures comprised:

> Swimming in the local lake (that we were not allowed, but we did anyway), playing hide and seek in the local graveyard, hunting hares and rabbits by making traps and nooses, wandering beyond the lake to pick palm fruits, climbing trees to pluck raw mangos and tamarind in the summer, collecting butterflies, dragonflies and Red velvet mites (also known as Birba Boti) in the Spring and often returning home with bruised knees and elbows (Nurul, reflective journal).

This passage appears to describe ecocentric or even technocentric relationships with nature, where humans appear to be distinctively taking advantage of natural resources. Acts such as swimming, playing, hunting, climbing, collecting delineate contours of 'human' bodies who do such actions *against* a 'natural' landscape. Feelings of risks and pleasures (Zembylas 2007b) could be materially mapped to bodies seeking pleasures in forbidden and unusual terrains, playfully controlling the other more-than-human (e.g., hunting hares and rabbits; collecting), savoring nature's fruits (palm fruits, mangoes, tamarind), only for the materiality of such encounters to "im-press" (Ahmed 2004) as bruises on their young bodies. Those bruises epitomize points of contacts, of being with nature, of being touched by nature. Here, nature touches; it is not only touched/played with. Nature plays (with) humans. Playfulness is extended to more-than-human others.

In other instances, Nurul recounts ordinary and natural processes of composting mango skins in their houses' backyard in Malyal. He says:

> Dad often arranged mango parties at home, we had an earthen pot full of mangoes in water, pot was covered with a dampen jute cloth that naturally kept the contents cool. We did not use a knife, squeeze one using hands then suck the juice. My brother and I were responsible for collecting all the skins and seeds and bury them in our garden (Nurul, reflective journal).

In this excerpt, we note how local knowledge is embodied in a technological artifact (Ihde 2009), "a dampen jute cloth," and ultimately in people's actions using alternative ways, locally informed techniques to keep mango cool during the hot summer months. Simultaneously, we could follow the ritual of savoring a mango, "squeezing one using hands then suck the juice" as an embodied and sensuous experience that ensures a fully savory experience otherwise denied to the trained palate had a knife (another technological artifact) been used. In this case, the absence of the knife as another technological tool, ensures a more embodied and unmediated experience. Eventually, composting took place in the most natural of ways, as Nurul and his brother collected remains of mango and buried them in their home garden. The absences of technological artifacts (knives, fridges, composting receptacles) appear to give immediate access to that which is 'nature' (Mango, skins, seeds, garden), possibly extending/confounding human bodies with their surroundings.

Thus, Nurul's reflections on those early experiences do not only reveal embodied re-encounters with nature, but they also show how technology is taken up in bodies through everyday mundane routines. Nurul speaks about how the start of the day takes place "before sunrise with multiple roosters crowing at once" followed by a "loud sound of a motor pump, pumping water from a huge well into a concrete-based ditch that divided into multiple canals which run into the fields to irrigate the crops" and "how the first person to come knocking at their door in the morning is Mohan, the milkman." This shows how *sounds* of nature and technology are taken up by his body and others' bodies (the milkman) as perceptions of time (start of the day). Extending this phenomenological analysis to post-humanist analyses, we can begin to trouble our assumed depictions of bounded (human) bodies who perceive time. Here, materiality emerges as bodies are blurred at the nexus of humans (Nurul, milkman), more-than-human (roosters) and technology (motor pump). In other words, humans do not merely make use of nature and technology to determine the time, but nature and technology entanglements with humans *do* time (Barad 2001).

Nurul's later education (secondary and postsecondary) occurred in two main urban cities in India (Karimnagar and Hyderabad, respectively) in which "the scene was completely contradictory." In those settings, he became part of a discourse that "emphasizes economic productivity at the expense of social and environmental responsibility." Nurul says:

> People did not care about nature, we had no idea where our garbage or waste goes (…), roads were crammed with fuming vehicles and people were super busy with jobs, businesses, education and making careers. The education system was designed to produce experts. Even I started to see and believe myself as a subject-matter expert when I graduated (Nurul, follow-up written reflections on life history interview).

As he re-encountered this period of his life, we could sense how bodies (including Nurul's) weighted on those two urban cities as humans sought to *occupy* (Ingold 2011) their surroundings through discourses on "expertise" and "economic productivity." This leads to further containment and demarcation of humans versus non-humans, illustrating once again people's technocentric and egocentric relationships toward nature. Nature was not merely omitted in Nurul's accounts of those life experiences, but nature was further produced in opposition to economic productivity and anthropogenic actions. In briefly retelling those experiences, it became clear to us that Nurul didn't want to dwell in a place where nature was absent. Or more rightly, nature was *produced* as absent, further sticking Nurul to particular forms of care within nature, with potential effects into ways nature might be talked about as part of his pedagogy.

Within science

Recalling his experiences as part of his formal science education in grade 11, Nurul is particularly reminded of:

> [His] three science teachers. They have taught forever and were considered the science trinity. They only cared about the right answer. Sometimes, we manipulate the results just to pass. Profound memory that science is the real thing, everything else is fiction (Nurul, life history interview).

Through this excerpt, we could probably follow affective economies of care as part of science/science education and ways they contour how Nurul might have experienced science in his secondary education. Those economies circulate through material bodies of three science teachers regarded as "the science trinity" who "only cared for the right answer." Religiosity and reverence for science as "the truth" materialize and are materialized by forms of care that stick Nurul to a view of science as the "real thing," a view of science as "objective, where reality is fixed, factual." We are left wondering how an insistence on the "right answer" as part of science enables a hard demarcation between what is "real" and what is "fiction." Those depictions of 'hard' science might have been accentuated/exaggerated to perform Nurul as a college instructor whose current views about science have grown in stark opposition to such initial conceptions of science, further evident in ways he comes to admit how he and his friends in class "would manipulate the result just to pass."

Nurul's previous realist views about science as "The Truth" (as he puts it) could be followed through his experiences in Zoology, his field of graduate studies. He mentioned how "in collecting an earthworm, we made sure that the earthworm was identical to the picture in the book, otherwise we would throw it away and look for that 'perfect' species." It appears that his realist epistemological views (i.e., science is a true representation of nature/reality) were dialectically informed by technocentric/egocentric orientations toward nature fueled by larger social, educational and economic discourses. This quote further brings into view a notion of science as interchangeable with nature. It appears that so-called objectivity of science, spills into a view of nature as needing to be equally perfect, objective, essentially un-defective. Such associations are sticky, re-producing normative distinctions within larger fields of science and science education and how they might inscribe bodies as ideal-less ideal, healthy-unhealthy (see Kirchgasler 2018).

> Nurul's formal exposure to STSE issues occurred as he pursued his Master's in education at OISE:
>
> Then, I would say OISE happened to me, different courses I took here, particularly with Larry and [other professors] gave me the opportunity to see science education completely through a different lens. I learned to see the interconnected nature of all disciplines, I developed naturalist views about knowledge production (Nurul, reflective journal).

We are attracted to affectivity embedded in this proposition: "Then, I would say OISE happened to me." This sentence attests to how places (in this case, places of teacher education) 'im-press' (Ahmed 2004) on bodies, the 'happening' of OISE, as an affective intensity (Massumi 2015), speaks to movement of the wayfarer. OISE is a place with an affective force along Nurul's path where he got to "see science education completely through a different lens." His Naturalist (Loving 1991) views about knowledge production were materially entangled with people and places. People and places exude affect unto epistemologies. Science epistemologies are imbued with affect (Jaber and Hammer 2016).

In making sense of his commitments to STSE education, Nurul referred to a culturally and personally relevant socio-scientific issue that was debated among his own family and a family friend ("Uncle") to whom he had deep respect and affection. The STSE issue was around "illegal logging" that took place in a forest that was, for him, "a playground as a child." He reflected on his uncle's "grief and concern over illegal logging, particularly of Teak wood trees (*Tectona grandis*) which were commercially valued." Those emotions of grief and concern are relational performing Nurul's uncle's own relationships with the forest as he explained to Nurul "how forests are more than home to numerous animals

and plants," stressing on "the interrelationship between plants, animals and their environment and how, if we remove one component, such as a tree, then the whole ecosystem gets impacted." Against this background, emotions of grief and concern are extended over to Teak wood trees as pedagogical companions along Nurul's own becoming, vibrating (within) a whole ecosystem and not merely inanimate objects, whose lives rest in the background.

Illegal logging, Nurul explained, took place following "government's policies to downsize the departments that deal with lands and forests," noting how "how the profit motive underpins the government's decision to provide industry easy access to forests and wildlife properties." Nurul's knowledge of powerful groups in STSE relationships was reflected in a personally meaningful experience that involved bodies with competing interests and to some of whom Nurul had close affinities (e.g., 'uncle', forest and the Teak wood trees). Teak wood trees and the issue of illegal logging, when recalled in the context of this research, perform Nurul as an instructor committed to new understandings of what science might mean.

Within science education

After finishing his master's degree in Zoology from India, Nurul was offered his first teaching position on a small island in the Republic of Maldives. In this context, he says: "I was able to relive some of my childhood experiences in terms of small community, connectedness, respect for nature and natural resources." In Maldives, he describes himself "not as a teacher, but as community member." After lots of trials and errors as a teacher, he slowly grasped merits of knowing his students at more personal levels. This greater intimacy coincided with his students' parents welcoming him and accepting him in their homes and community since they "recognized from his name that he was a Muslim just like them." In this instance, Nurul was readily identified as part of a religious identity which facilitated more direct bodily encounters with his students and their parents, giving him access to their personal lives, homes and contributing to his pedagogical priority to knowing his students more personally prior to teaching them science.

Referring to his interactions with students on the island, Nurul says:

> In the practical science courses, students would tell me: "Teacher, let's go," and I would ask: "Where do you want to go?". They say: "The beach". It's like their laboratory (Nurul, life history interview).

We stop at the words, "Teacher, let's go," as a pedagogical invitation for movement that refuses containment, structure and closed-endedness. The wayfarer, Nurul, is *his* movement alongside other wayfarers (Ingold 2011). Rather than the teacher taking the kids from one place (the classroom) to the other (outside the classroom), *transporting* them across preexisting locations, here the teacher is being invited into "going" alongside others, it is the *lived curriculum* (Aoki 1993), embodied in intimacies from having lived daily with students/their parents and knowing alongside each other. Later, he mentioned how his students "taught him lots of things, such as names of creatures in the ocean." They taught him "swimming, snorkeling, as they form a circle around (him) to watch out that (he) doesn't go in the deep water." Bodies forming a circle around their teacher attest to an ethic of care (Tronto 1993), fusing teaching and taught bodies and not merely inversing who teaches and who gets taught. He continues saying: "The beach was their daily afternoon leisure, eating from jackfruit trees, hanging on comfortable swings, reading books and watching

the sunset." As he paints this scenery of humans indulging into pleasures of being 'outside' with nature, nature seems to be romanticized, a human experience, contouring yet again, humans' bodies as separate from nature.

Nurul further mentioned how his first teaching job in the Maldives allowed him to develop genuine concerns for human actions on environments, "especially with the looming dangers of global warming and rising sea levels that threatened local communities of the islands." During that time, Nurul experienced, first-hand, fears and anxieties of a population that was under the threat of inundation "due to human actions in other parts of the world," pointing to how climate change was viscerally experienced and disparately influencing communities. He mentions:

> The islands are on average 1–1.5 meters above the sea level and based on the current trends and the predictions of the future rise in the sea levels by climate scientists (IPCC), it can be reprieved for another two or three generations at the most. Hence, this topic of going extinct was so hot in every conversation (Nurul, life history interview).

Dangers and threats of nature related to climate change pose risks that remain deeply affective. Nature is not only beautiful but can be equally scary. Living in anticipation of the dangers of climate change is an affective state, unequivocally shared among different populations around the world. This brings into view new pedagogical questions around unequal distribution of affective economies linked to climate change, texturing communities (and not others) over imminent fears, enacting the very socio-material fabrics being sensed by those communities as their worlds (Williams 1977).

> As a science teacher, I was involved in numerous discourses about the issue. It was expected from me to provide little more explanation and justification for the global warming than just some scientific explanation of how the sea levels were increasing. I could see the helplessness of a complete nation and the imminent danger that they were placed in due to our own technological advancements (Nurul, reflective journal).

This quote provides insights into ways affective economies of climate change (fear, helplessness)—as they pertain to Nurul's own life within Maldivian communities—circulate in discourses that demarcate what is science ("scientific explanations of how sea levels were increasing") from what is non-science ("justification for the global warming"). Such demarcations stick Nurul to his role as a science teacher in this particular community, while gesturing at the same time to how he came to re-imagine what science education could mean following his involvement with STEPWISE.

As Nurul took on his second teaching position in Saudi Arabia at "a private elite school", his descriptions of this period of his life were brief, revealing feelings of alienation from a teaching position in which he was perceived more as "a salesperson, than a schoolteacher." He recalls how he developed study material for his grade 11 students who didn't have a textbook to study for their International General Certificate of Secondary Education (IGCSE) tests and how, soon after, the school principal turned those developed materials into a "profitable product." He says: "Students were the clients and the teacher could be summoned at any time to deliver extra teaching sessions." He further experienced discrimination as an Indian citizen compared to his counterparts who had US or European nationalities. He says: "We had same responsibilities, same teaching hours, but American and European teachers would get paid double." Nurul felt devalued and dissatisfied within a "corporate" school system, alienated by an education that privileges certain

bodies (Western teachers, private school children from rich expatriates' families) who get "special treatments" over others (non-Western teachers). Practices within corporatized educational systems, steeped in neoliberal forms of governance of schools (Apple 2013) might re-inscribe and further help constitute Western and non-Western bodies in opposition (Said 1995). Nurul's "otherness" as a teacher from India is contoured through affective economies that circulate in citizenship documents, school salaries, extra teaching lessons and overworked bodies. He distanced himself from this system of education by resisting to dwell with those experiences, recounting them with much brevity and once more, without any reference to his relationships to nature. Once again, the absence of nature might extend Nurul as somehow absent in his own past pedagogies, gesturing to Nurul's desires to be in different relationships within science education.

Becoming alive within STEPWISE/science education

Becoming alive could be regarded as a continuous state of striving, borrowing from Spinoza who says, "all existence is intrinsically striving" (Spinoza cited in Colombetti 2013, p. 4). It is an incessant "coming into presence" (Biesta 2010) into our research and pedagogical practices. As a pedagogical journey, collectively, yet distinctively traveled by each of us collaborators from our past (life) experiences, STEPWISE brought us in touch with Nurul, with his life along other lives. "These lives are not traced, as we might trace lines on a cartographic map, across a world already laid out, but *through* a world in perpetual formation" (Ingold 2011, p. 168, *emphasis in original*). Nurul's life with others was perpetually produced, through the life history research, to extend his striving within STEPWISE. The life history research, as tinkered with here, does not only afford capacities for Nurul to come into presence (to continuously strive) in his own pedagogy but the pedagogy itself (i.e., STEPWISE) allowed us to come into the presence with this work and with each other. Points of contact between life history research and STEPWISE as a pedagogy allowed us to re-encounter Nurul's life in new ways. Moreover, such points of contact contoured Nurul as an instructor who can enact forms of care that lie outside what is formally cared for within the particular context of college education. STEPWISE most fundamentally asks: What is science? What does it mean to learn science? For what? STEPWISE opens spaces to be in different relationships with science and technology, perhaps, intervening in ethico-political projects of science/STEM education (Zouda 2018). Hence, the life history research does not neatly feed into making sense of Nurul's commitments to STEPWISE relative to his work context. Instead, it created unpredictable openings as we continuously travel with STEPWISE-like approaches from our various situated practices.

Some of the onto-epistemic movements—depicted through our efforts storying Nurul's life with others—seek to (de)stabilize thematic analysis, to present how lived histories could extend beyond simple meanings and reflective stances, to (re-)produce what is nature and what is human (among other demarcations). We wish to suggest that life histories could *become* pedagogical opportunities to move teachers/students into new ways of being within nature, science and science education. This research, then, responds to calls for "triggering a conceptual vitality within science education" (Wallace et al. 2018, p. 201), whereby "educational bodies of science and science bodies in education" (Alsop 2016, p. 555) come to matter to/with one another. This conceptual vitality within science education is needed in times of social and ecological problems, enabling teachers/students/researchers to "re-imagine sustainability in precarious times" (Malone, Truong and Gray 2017).

In subtler ways, this research meets previous research that looked at how views about "objectivity" as part of school science are emotionally mediated (Davis and Bellocchi 2018). It invites further attunements to affective economies when circulating in acts of storying/performing nature, science and science education. Such economies might carry effects into ways teachers enact pedagogies aimed at social and environmental justice within science educational contexts. Attending to affective, aesthetics and embodied registers within one's relationships to nature, science and science education invite and reconnect to questions such as: How might notions of affective economies/emotions be more leveraged in discussions of climate change? How/Which bodies/lives are talked about and performed within science education contexts and what/who gets left out (Alsop 2011)? What absences or demarcations circulate in affective economies of science education? How might they stick students/teachers to ways of being, relating and knowing (with) more-than-human lives, science and technology? How might we as teachers/educators care for/within nature differently (de la Bellacasa 2011)?

Modalities of care toward nature may necessitate specific attention in ways they get taken up through our science educational practices. Caring is necessarily affective, non-innocent and political (Murphy 2015). When asking our students to care for nature, do we retain nature as a mere resource to be cared 'for'? How is 'nature' talked about in classrooms? Returning to de La Bellacasa's work around soil, she offers critical perspectives on conservationist and sustainability efforts that want to care for the soil in more 'sustainable ways' while still working from a premise that maintain soil as essentially a resource for humans. Thus, teachers, especially committed to science and technology education for sustainability, may engage in re-thinking along with their students, their modes of care within nature that might extend beyond "paradigmatic modes of technical rationality" (Carter 2011, p. 3) to consider alternate knowledge practices that draw on complicated (colonial) histories of 'natural' places within science and environmental education (Nxumalo 2015).

Becoming alive within (life history) research

Thinking with life history(ies), bodies and stickiness enabled us to question our initial desires for representing 'human beings' which appeared to rest on unexamined assumptions of "extraction and proceduralism" (Springgay and Truman 2018). We sought to collect (extract?) data about Nurul to tell an 'interesting' story that would lead us to uncover his commitments to a pedagogical approach, STEPWISE. Such acts of extractions to tell an 'interesting' story troubled us as they appeared to commodify Nurul's and others' live stories. Instead, we sought ways to turn life history research into an approach for "becoming entangled in relations" (Springgay and Truman 2018, p. 2) with others.

Posthumanism and constructions of nature-human relationships have not yet received enough attention in science education research (Higgins, Wallace, and Bazzul 2019), while life history research continues to be a vibrant field, ripe with different methodological and theoretical affordances for studying science teacher identities (Avraamidou 2016). Life history research may be one suitable medium to tinker with humanist and biographical approaches to storying lives, even though, one might ironically remark, how the present research ended up tinkering with 'us' (note how our linguistic devices seem to always succeed in setting 'us' outside our research). Life history research turned into a methodological journey, along which our epistemic, axiological and ontological commitments were continuously shaped and re-shaped as we encountered lives (and possibilities for becoming

alive) within Nurul's storying. We thought we could unproblematically read his life with others within post humanist research traditions yet found that we always needed to start from humanism. For instance, thinking *about* life history (assuming a knowing stance of what life history 'means') provided us with a path for thinking *with* life history(ies). Moreover, thematic analyses appeared comfortable to us from previous "uses". Ahmed (2019, p. 43) writes: "use can mean the lessening of receptivity to others". When our methodological approaches have long been calibrated and *used* in ways that give primacy to language, to meanings—in this case to what is uttered by Nurul during our interviews together, to his voice as meaningful data—our attunements to other material and embodied enactments during interviews were lessened, relegated as 'irrelevant' to this research, perhaps out of a buried "desire to control difference" (MacLure 2017, p. 3–4). Recoiling onto humanist traditions was further mediated by our own positionalities as researchers. As some of us collaborators are candidates in their PhD programs in science education, we wondered if we were stepping onto risky terrains by fully inhabiting a literature (i.e., 'posthumanism') that continues to be challenged and revisited (Badley 2018). Writing this piece was deeply an affective experience, not the least because of our methodological and theoretical dilemmas, but because of haunting fears mixed with desires for belonging to communities of research within science education steeped in certain traditions more than others. It is, perhaps, in this methodological *striving* that one might encounter this work, in its inability to completely release itself from that which has turned so sticky, always involving uneasy "(in)tensions" (Springgay and Truman 2018).

Extending beyond the life history as a methodology, this work finds resonance in calls for finding pedagogical possibilities within "seemingly mundane corporeal aspects of (…) performances and representations" (Alsop 2011, p. 611) as teachers/students re-encounter their subject matter (e.g., science, STSE education) and others and as we, researchers, re-encounter our research (e.g., data) and our research participants.

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