How moments add up to lives: Flat CHAT assemblage, embodiment, and lifespan becoming

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Note: This paper was the basis for a shorter talk (with slides) that I presented at the symposium. Several sections of the paper draw closely on a published article I co-authored with Anna Smith that is available open source:

> Anna Smith and Paul Prior. (2020). A Flat CHAT perspective on transliteracies development. *Learning, Culture, and Social Interaction*, *24*, 100268. https://doi.org/10.1016/j.lcsi.2019.01.001

In preparing this ms. to share after the conference, I have also updated a few references that were in press.

Abstract:

Asking how multiscale development produces both persons and societies, Lemke (2000) highlighted "the circulation of semiotic artifacts (i.e., books, buildings, bodies) that enables coordination between processes on radically different timescales" (p. 275). A Flat CHAT assemblage perspective (Prior & Olinger, 2019; Prior & Schaffner, 2011; Smith & Prior, 2020) argues such circulations depend on a rhizomatic, dialogic, material-historic architecture for *becomings* (Barad, 2007). Rejecting neo-Platonic reserves that escape relentless material motion, Flat CHAT assemblage means that no societies, languages, norms, discourse communities, activity systems, persons, cognitive structures, or genetic codes sit placidly above the dispersed constantly flowing movement of historical materialities. Lifespan becoming then happens as embodied moments are dynamically, temporally but temporarily, accumulating and shedding. In this paper, I draw on a lifespan case study of a biologist to explore how affective intensities (Leander & Boldt, 2013) across moments built not only this trajectory of becoming a biologist but implicated the human and non-human networks through which that trajectory becomes textured into a recognizable lifeworld. Based on interviews (life-history, semi-structured, and text-based), participant observation, a collection of texts that reach back to elementary school, and memory, I trace *resonances* (Stornaiuolo, Smith, & Phillips, 2017) across four moments in her becoming: a response at age 5 to an episode of a documentary nature program, a family pretend game focused on imaginatively saving animals, a day in a forest in Uganda with field guides observing a group of monkeys, and an interaction as she was writing her dissertation.

Paper

Asking how "moments add up to lives" and "our shared moments together add up to social life as such" (p. 273), Lemke (2000) highlighted "the circulation of semiotic artifacts (i.e., books, buildings, bodies) that enables coordination between processes on radically different timescales" (p. 275). However, accounts of learning and coordination have often depended on identification of some human, social, or cognitive neo-Platonic architecture, whether universal language competence, norms of some community, or schema theories. Linking Voloshinov's (1973) radical argument that "language is a purely historical phenomenon" (p. 82) to rhizomatic accounts of material-semiotic phenomena (Deleuze & Guattari, 1987; Latour, 1999, 2005) and CHAT (cultural-historical activity theory) accounts of activity and learning (e.g., del Rio & Alvarez, 1995; Engeström, 2006; González Rey, 2011; Vygotsky, 1987; Wertsch, 1991), I offer an alternative architecture, Flat CHAT assemblage (Prior, 2008; Prior & Olinger, 2019; Prior & Schaffner, 2011; Smith & Prior, 2020). Flat CHAT assemblage argues that the coordinated circulations Lemke invokes depend on a rhizomatic, dialogic, material-historic architecture for *becomings* (Barad, 2007).

Resisting neo-Platonic purification

I want to begin with a taken-for-granted term, *the person*. *The person* figures centrally in stories of learning and becoming, in relations with the environment, and in descriptions of human action and experience. *The person* is typically construed as one biological thing, formed from the environmentally-shaped unfolding of a particular genetic code across the lifespan. Hutchins' (1995) account of distributed cognition in the wild—drawing broadly on Vygotskyan traditions of sociogenesis that highlight processes of internalization, externalization, and tool use—aimed to

soften the boundaries between *the person,* other persons, things, and environments. I start here because from the perspective of current biology, *the person*, so conceived, appears to be a deeply ideological fiction, an idealized purification credited with much greater coherence and stability than is warranted.

Biology suggests each of us is already a community, the human microbiome, where roughly half of the cells in the envelope of the body are *homo sapien*, the rest being bacteria, archaea, viruses, and eukaryotes (nucleated microorganisms, like protozoa and fungi) (Shapiro, 2019). Critically, it is increasingly clear that this microbiome is dynamic, sociomaterially varied, and consequential (e.g. we cannot survive without our microbiome). Many biologists now see bodies as holobionts (hosts plus their microbiomes) and holobionts as the basic unit for evolution (Bordenstein & Theis, 2015). Likewise, that stable genetic code, the fixed-at-birth blueprint offering coherence to our individual lifespans, is another fiction. Epigenetics and somatic mosaicism mean that over the historical trajectory of a lifespan experiences affect gene expression significantly and basic genetic processes transform the genomes in our cells so that, for example, in an adult human brain it appears that no two cells share exactly the same genome (Paquola, Erwin, & Gage, 2016). It has also recently become clear that pregnancy results in persistent microchimerism as fetal cells and maternal cells mingle in both directions, persist postnatally, and have biological functionality (e.g., Kinder, Stelzer, Arck, & Way, 2017). Muotri and Gage (2006) have suggested this kind of genetic heterogeneity is central to human cognitive functioning and consciousness (as well as being a source of disease and marked difference). Neurodiversity in this sense is not just a political-ethical stance to empirical differences among people, but actually a basic characterization of individual brains (no two cells having identical genomes).

Neo-Platonic idealization and purification of *the person* is mirrored in idealization and purification of *the social*, which has been imagined as autonomous social territories like cultures, discourse communities, institutional sites, even activity systems and communities of practice. Disciplines, for example, are typically represented as idealized, territorial, purified communities that people *enter into* and *join*, communities that "have" genres, members, borders, and rules that govern disciplinary activity (see critiques in Prior, 1997, 1998, 2003; Olinger & Prior, 2019). This ideology is robustly grounded in a matrix of commonsense tropes and typifications:

- conduit metaphors for communication and container tropes for social groups and institutions (Lakoff, 1987);
- the neo-Platonic imaginary where macrosocial norms and rules *govern* individual performance, which led to Garfinkel's (1967) characterization of sociology's and *person* as a "cultural dope" (p. 68) ;
- the dominant political ideology of nationality (Anderson, 1991); and
- linguistic typifications of social groups.

It is striking that despite different theoretical terms for the social (speech communities, discourse communities, communities of practice, Discourses, activity systems), examples replicate already named and typified social categories—home, school, work, high school jocks, biker bars, butchers, physicists, medical clinics.

Practice and activity theoretical accounts of learning have not been immune to neo-Platonic formulations embedded in everyday maps of the social. Although Lave and Wenger (1991) described learning as "trajectories of participation" (p. 121) in evolving social practices that simultaneously

continue and transform social formations and identities, when it came to disciplines, their account reverts to strikingly territorial representations:

> in most high schools, there is a group of students engaged over a substantial period of time in learning physics. What community of practice is in the process of reproduction? Possibly the students participate only in the reproduction of the high school itself.… The reproduction cycles of the physicists' community start much later, possibly only in graduate school. (Lave & Wenger, 1991, p. 99)

Drawing on practice and CHAT theories of language, learning, and literacy to analyze data from a 7-year study of relationships between university study in professional fields like architecture and work in corresponding professions, Dias, Freedman, Medway and Paré (1999) also concluded with a startlingly autonomous account of disciplinary literacies:

> Writing at school and writing at work are indeed worlds apart. Writing *is* acting, but in Activity Theory terms, writing at work and writing in school constitute two very different activities… *we write where we are…* location, it would appear, is (almost) everything. (p. 223)

If a student's work in a senior architecture design course in April is irrelevant to her work in an architecture firm in May, then what possible relevance could there be for more distant experiences—other courses in college; k-12 schooling; home life; community activities; or childhood play?

Even uptakes of Latour's flat actor-network theory can end up reinscribing neo-Platonic frameworks. For example, Brandt and Clinton (2002) argued that research on literate practice had been too local and turned to Latour to remedy this problem, reconceptualizing literacy as *a* thing-in-action, "*a* transcontextualizing social agent" (p. 351, italics added) that can bridge the micro- and

macro-social. Notice, however, that Latour is being invoked here to bridge a gap he explicitly rejects as a legitimate architecture for society: the microsocial-macrosocial divide. As Andrea Olinger and I have asked, "How can a flat architecture that invites us to follow trajectories converging in and spinning off from artifacts and events —things small, mobile, massively multiple, constantly becoming—be invoked in support of literacy writ very large in the singular?" (Prior & Olinger, 2019, p. 130).

Flat CHAT assemblage

Rejecting neo-Platonic reserves that escape relentless material motion, Flat CHAT assemblage means that no societies, languages, norms, discourse communities, activity systems, cognitive structures, or genetic codes sit placidly above the dispersed constantly flowing movement of historical materialities. Lifespan becoming then must be accounted for as embodied moments are dynamically—temporally but temporarily—accumulating and shedding. Flat CHAT assemblage (Prior, 2008; Prior & Schaffner, 2011; Smith & Prior, 2020) takes up central concepts of cultural-historical activity theory (CHAT) but articulates them in a flat, rhizomatic ontology, drawing especially on Latour's (2005) Actor-Network Theory (ANT). It sketches an architecture for the social that sees activity as fundamentally historical—as the laminated assemblage of people, artifacts, practices and environments form complex trajectories of becoming and produces what González Rey (2011) calls a subjective sense that emerges from "the collateral effects of living an ongoing human experience" (p. 49).

CHAT emerged in the 20th century out of varied blends of Vygotsky and Luria's psychology (Vygotsky, 1987; Luria, 1928), Voloshinov and Bakhtin's semiotics (Voloshinov, 1973; Bakhtin,

1986), pragmatic accounts of human development (e.g., Dewey, 1916), and phenomenological and practice approaches in sociology and anthropology (e.g., Schutz & Lukmann, 1973; Goffman, 1974; Bateson, 1972). What entangles these traditions is that all resist accounting for human thought, action, and being in terms of idealized, unified, top-down governors and instead highlight the fundamental role of richly equipped, emergent, embodied activity in the world.

CHAT is broadly grounded on the common ground that "activity is *situated* in concrete interactions that are simultaneously *improvised* locally and *mediated* by prefabricated, historically-provided tools and practices" and that it involves "*externalization* (speech, writing, the manipulation and construction of objects and devices) and *co-action* (with other people, artifacts, and elements of the social-material environment) as well as *internalization* (perception, learning)" (Prior, 2006, p. 55). Learning as the sociohistorically-mediated formation of a person's consciousness makes CHAT's theory of society and its mechanisms critical. Although the focus on concrete, material histories would seem to require a dynamic, dispersed, and flat (rhizomatic) architecture of the social, CHAT has often depicted the social in synchronic terms of vertical macro-actors and purified activity systems.

For example, Engeström's (1987) expanded activity system triangle has pictured the social as vertical and institutionally-anchored and has privileged the perspective (idealized object) of the institution (e.g., in the routine identification of the *subject* of activity systems as the official, front-stage representatives of the institution—doctors in hospital, teachers in schools). As Hengst et al. (2016) note, the subject node also imagines a normatively embodied, interchangeable subject, and as Bozhovich observes, there are non-trivial challenges in identifying the *object* of collective activity:

> In trying to analyze which needs "crystallized" in one or another "motive," what is behind the child's inclination toward one object or another, we found a complex knot of needs, desires, and intentions where it was difficult to understand which was the object of an activity and which the motive. (1978, translated and quoted in González Rey, 2011, p. 37)

Engeström (2006) proposed the horizontal notion of mycorrhizae formations, but asserted the continued centrality of vertical institutions (metaphorically the plants and trees that rise above the surface) and has generally externalized situated lamination as relations among distal activity systems (e.g., Engeström, 2009.

However, if we take lamination as fundamental, the vertical does not disappear, but it also does not stand above it all just as the horizontal does not simply lie like mycorrhizae at its deep roots. Vertical and horizontal are deeply entangled: the vertical is shot through with horizontal otherness as multi-object, multi-actor, multi-community phenomena infiltrate the whole structure of the plant (the school, the hospital, the workplace), and the vertical in turn repeatedly splinters out and embeds in the horizontal. Discussing Hedegaard's (2014) analysis of a young girl's entangled transitions and personal motives as she moved from school to home contexts, Zittoun (2014) notes:

> …from a temporal perspective, the child has a continuous experience; it is he or she who moves from home to school, or plays with a parent then a friend (Hviid, 2008). Of course, some aspects of this experience are foregrounded in specific settings — being the older brother might be more relevant at home than at school; yet these experiences do not switch on and off (p. 233).

The temporal continuities that move *across* time, space, and activity can be illuminated with Latour's (2005) flat rethinking of emergent sociomaterial realities through a sociology of associations that:

- localizes the global, seeing how it is located in specific sites and moments,
- redistributes the local, seeing how it leads beyond a site and moment, and
- connects sites, seeing the links in networks, the chains of localities, events, things, and people woven together in trajectories.

A flat architecture of becoming resonates with Barad's (2007) argument for the notion of *intra*-activity—a terminological twist to emphasize that everything is always becoming, intra-acting, not already made and just inter-acting. Intra-actions, Barad explains, do not happen *in* space and time, but instead are "*the dynamics in which spatiality and temporality are produced and iteratively reconfigured in the materialization of phenomena and the (re)making of material-discursive boundaries and their constitutive exclusions*" (179, italics in original). She goes on to argue that "what we need is something like an *ethico-onto-epistemology*—an appreciation for the intertwining of ethics, knowing, and being—since each intra-action matters, since the possibilities for what the world may become call out in the pause that precedes each breath before a moment comes into being and the world is remade again, because the becoming of the world is a deeply ethical matter" (185). Barad's call resonates with Haraway's (2016) evocation of the Chthulucene, the age of tentacular entanglement, where sympoesis (making-with) and becoming-with are central:

> "... the Chthulucene is made up of ongoing multispecies stories and practices of becoming-with in times that remain at stake.... human actors are not the only important actors in the Chthulucene with all other beings able simply to react. The

> order is reknitted: human beings are with and of the earth, and the biotic and abiotic powers of this earth are the main story" (p. 55).

Textures of Experience for chronotopic becoming

Vygotsky (1987, 1994) offered some especially rich frameworks for thinking about the textures of experience that arise in material-historical accounts of action and becoming with the notions of *sense* (see uptakes in Prior & Shipka, 2003) and *perezhivanie* (a Russian word that can reposition experience as event, as the distributed character of experience as embodied, affective, cognitive, and equipped). As Gonzalez Rey (2011, 2017), Veresov (2017), and Roth (2017) articulate this notion it certainly indexes but is not reducible to affect. *Perezhivanie* posits experience as distributed across people and their historical, material, embodied environments. Critically, these notions also index the dialogic (in Voloshinov's 1973 sense; see also Linell, 2009) character of all experience, that a local moment participates in chronotopic flows (see, e.g., Prior & Shipka, 2003 Karsten, 2011; Kell, 2011). Of course, becoming is not linear and all moments are not equally consequential; thus, Leander and Boldt (2013) call for nonrepresentational frameworks attentive to affective intensities:

> A nonrepresentational approach describes literacy activity as not determined by past design projected toward some future redesign, but as living its life in the ongoing present, forming relations and connections across signs, objects, and bodies in often unexpected ways. Such activity is created and fed by an ongoing flow of affective intensities that are different from the rational control of meanings and forms. (p. 36)

Such textures of chronotopically dispersed experience move through trajectories of lifespan becoming (Erstad, Gilje, Sefton-Green& Arnseth, 2016) and the ontogenesis of literate and semiotic practices (e.g., Roozen & Erickson, 2017, Pahl, 2007; Mäkitalo & Erikson, 2013).

A lifespan case study

In this paper, I draw on a lifespan case study of my daughter, Nora, a post-doctoral biologist, to explore how *affective intensities* (Leander & Boldt, 2013) across moments built not only her trajectory of becoming a biologist, but also implicated the human and non-human networks through which that trajectory has become textured into a recognizable lifeworld. The case study is based on life-history, semi-structured, and text-based interviews; participant observation; a collection of texts that reach back to elementary school; and memory (see also Prior, 2018; Prior & Olinger, 2019; Smith & Prior, 2020). I trace *resonances* (Stornaiuolo, Smith, & Phillips, 2017) across four moments of affective intensity in her becoming: 1) an evening when at age 5, watching an episode of a documentary nature program, she broke out sobbing at the plight of a young cheetah and announced that she would go to Africa to save animals; 2) a family pretend game focused on imaginatively saving animals from Cruella de Vil (the Disney movie villain who kidnapped baby animals to make a fur coat); 3) an account of a day in a forest in Kibale Park, Uganda where she and field guides were observing and collecting fecal samples from a wild group of red colobus monkeys, and 4) a challenging moment from the writing process as she was working on an article that would become part of her dissertation. I argue that what coordinates these four moments is not only the resonance of identity-making affective intensities, but also the convergence in each of a whole host of human and non-human material-semiotic artifacts and practices (e.g., children's books, bird-

watching, multiple trajectories of scientific and technical production of knowledge and tools, home and school pedagogies of science, domestication of dogs and cats and practices of family pets, multiple forms of disciplinarity spread across public and home lifeworlds, etc.).

A moment: Chronotopic flows to and from the family living room

One Sunday night in January of 1993, when Nora was 5 years old and in kindergarten, the family watched an episode of *Nature*, an educational TV program that focuses on animals, plants, and ecosystems and that we as a family watched regularly. Here is a synopsis from *Nature*'s website that describes that episode, "Cheetahs in the Land of Lions":

> Very few cheetah cubs in the Serengeti survive to become adult. The struggle of a female cheetah to keep her cubs alive is captured on film as two surviving cubs learn to hunt and to interact with other wild animals, including other cheetahs, on their journey to independence from their mother. This is a dramatic study of cheetah behavior set against the spectacular landscape of the Serengeti plains.

I recall Nora being enthralled with the cheetahs, with the mother's struggle to care for her cubs and the cheetah family's struggle to survive on the Serengeti. Toward the end of the program, the mother leaves one of the cubs to survive on its own. I recall Nora breaking down sobbing for minutes and declaring that when she grew up she would go to Africa and save the animals, especially the cheetahs. This *moment* of affective intensity has become a repeated family story, along the lines of 'Nora decided in kindergarten that she would go to Africa to study and help save the animals and she did.'

I want to note that Nora's reaction to this episode of *Nature* was not a singular event but part of already densely entangled life trajectories: she lived in a house with a dog and two cats; slept

in a bedroom that had many stuffed animals, plastic figures of animals, and books that featured animals (both as biological organisms and anthropomorphic characters); and often watched animated films featuring anthropomorphic animal characters (e.g., *Pooh Bear*, *Babar*, Disney's *Lady and the Tramp*, all of which we had Beta or VHS tapes of to watch repeatedly). Affectively, Nora also knew that before she was born, our first child, a boy, was stillborn, and she mourned the loss of this brother just as she had been joyous 15 months earlier with the birth of her sister, Anna (so there were resonances here in the sibling cheetahs and their mom).

Let me pause here to make two critical clarifications about how I interpret this event in Nora's becoming.

1. To the best of my recollection, the night of the *Nature* show on cheetahs was the first time Nora articulated the notion she was going to Africa, but that vision persisted as evidenced by her repeated mention of it in her 4th grade book all about me (see Figure 1 below).
2. I want to make clear that I am not arguing Nora became a biologist because of the events of this night or that there was any inevitability to her trajectory from this point forward. However, I am arguing that the affective intensity of that moment matters, that it resonated dialogically, as it happened, with *perezhivanie* before and after that night. Critically, I do not think that attending to this moment is simply a testament to our ability to construct retrospective, teleological narratives: sometimes we can find narrative lines because there are lived stories to tell.

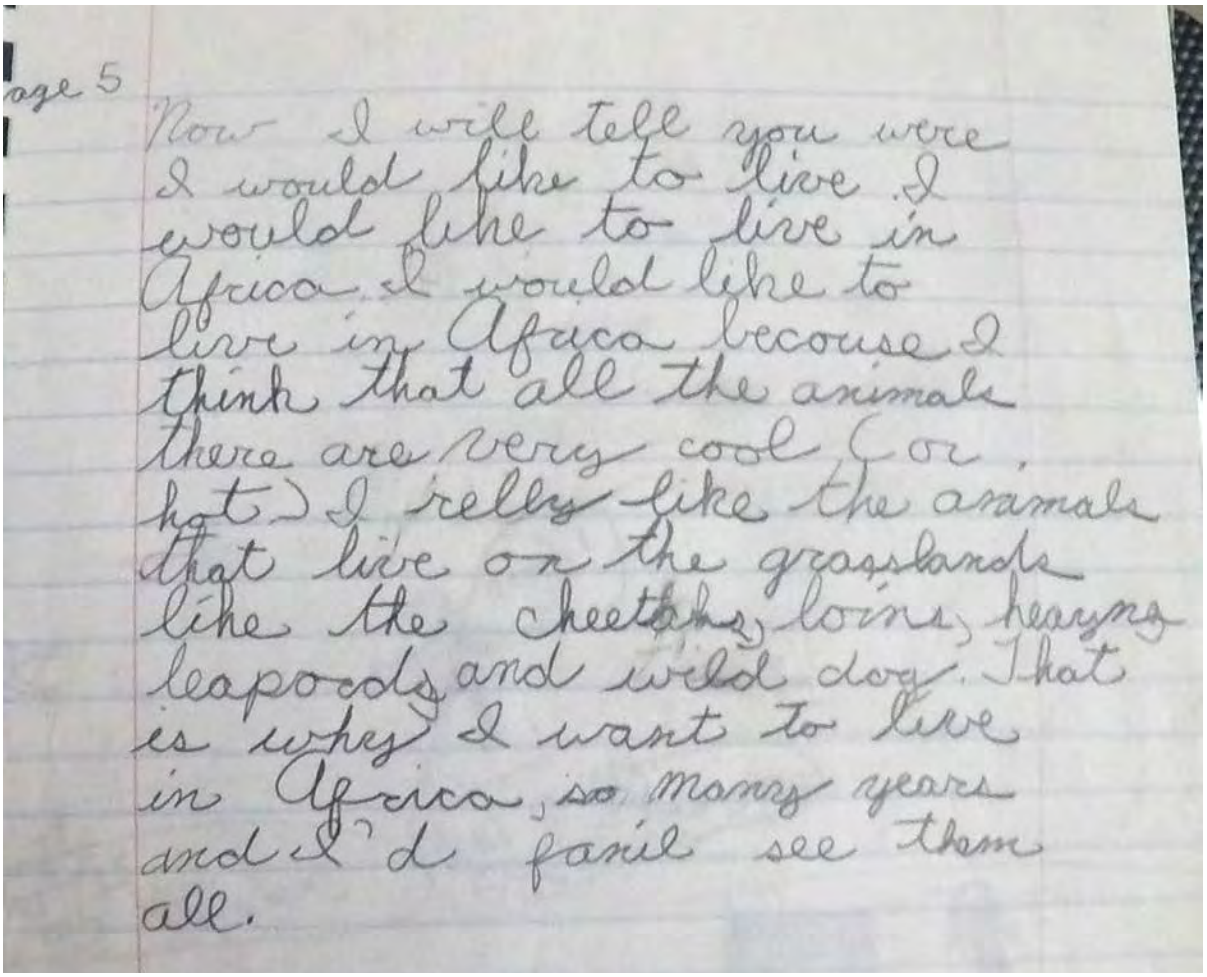


Figure 1: From Nora's 4th grade compilation of class assignments, *All About Me*. This page was written in response to the question: Where would you like to live? Her answer indexes the perezhivanie around *Nature*'s "Cheetahs in the land of lions," explicitly mentioning Africa, grasslands lions (spelled as loins), and cheetahs .

I also want to underscore that the histories that shaped this moment in the stream of *perezhivanie* Nora participated in were also more widely distributed. Family pedagogies of natural history (observing and collecting plants and animals) emerged, for example, in England and Europe in the second half of the 1700's with books like *The Newtonian System of Philosophy Adapted to the Capacities of Young Gentlemen and Ladies* by Tom Telescope (first published by John Newbury in 1761, see accounts, for example, in Talairach-Vielmas, 2011) along with the emergence of public and private collections of animals, plants, and other scientific material. Moreover, Julie, Nora's

mom, had spent much of her youth playing in nature and carried over that awe and interest into her adulthood and parenting (and not incidentally prodded me to develop these interests around observation of birds, plants, animals and insects). In short, that moment was very much a multi-trajectoried assemblage.

Cindy Magic and the vampire bat

In 1991, Nora (then 3 1/2 years old) and I were on a long drive through Wisconsin and Illinois. Motivated by the need to pass time and by Nora's recent viewing of—and deep anger and distress about—the animated Disney film *101 Dalmatians*, we began to develop a pretend game, which eventually came to be called *Cindy Magic*. Originally, Nora imagined a new persona, Cruella Magic (a heroine to counter Cruella de Vil, the villain who kidnapped Dalmatian puppies to make a fur coat). Cruella Magic (Nora) would find and save lost or kidnapped baby animals. Playing their parents, I would knock on the car window, Nora would answer, and I would ask about my alliteratively named babies (e.g., "Hello, this is Tina Tiger. I've lost my children: Tammy, Tom, and Teresa. Do you have them?"). Cruella Magic (Nora) would always have rescued the children and would return them to the very grateful parent (me). Then I would knock again, starting a new sequence ("Hello, this is Holly Hippopotamus…"). We played that game for hours that day, and it persisted over the next 6 years with increasing complex scenes and character, typically played in the car or during chores. It eventually focused on the lives of the daughters of Cruella Magic's sister, Cindy Magic: Mary (Nora), Elizabeth (me), and eventually Jane (Anna). The sisters' adventures ranged from the fantastic (e.g., using satellites and robots to locate a kidnapped mother who was booby-trapped with bombs by Cruella de Vil) to the mundane (e.g., cooking an imaginary dinner).

Julie studied this game during her PhD, and we have both analyzed and theorized her data (e.g., Hengst & Miller, 1999; Prior et al., 2006). Figure 2 is an image from an episode of the game when Nora was 7 and Anna was 3. Nora and Anna are pointing to a spot on the rug imagined tacitly as a window from the second floor of the Magic home looking into the backyard, where Cruella de Vil and her hunters have captured our usual allies (cheetahs and robots). Nora's utterance '(Can you go suck up blood") in the role of Mary Magic is addressed to me as a vampire bat (this episode was analyzed in greater depth in Prior et al. 2006).

Figure 2: Video image from an episode of *Cindy Magic* in 1995 (see Hengst & Miller, 1999; Prior et al., 2006)

Cindy Magic, with its focus on animals and leadership, was part of Nora's broader engagements with nature (reading books, watching films, bird watching, playing with pets, hiking and kayaking) that converged in her decision to major in biology.

Seeing self-medicating monkeys in Kibale in her junior and senior year of college

The summer after her junior year in college, Nora arrived in Africa to spend three months at Makerere Biological Field Station in Kibale National Park, Uganda. Her research aimed to document whether red colobus monkeys were eating the bark of African Cherry trees to self-

medicate for Nodule Worm Egg parasites. The bark was known to kill the parasites at a particular stage of their development. Having observed males apparently engaging in this behavior, the Principal Investigator (Tom Gillespie) was interested in seeing if females did it and also in understanding how the monkeys learned this practice. At the field station, Nora went out almost every day over three months with several Ugandan field guides to collect field samples and notes. She then flew samples and notes back to Illinois and analyzed them in Gillespie's lab at Emory University (where he had moved just before she left for Africa). The two slides in Figure 3 are from Nora's presentation of the research at the 2010 Association for Environmental Studies and Science (AESS) Conference in Portland, Oregon. The three images of the study system slide visually isolate their objects, with the words offering windowpane references (code-shifting from common English to scientific Latin names). Likewise, the bulleted list of the methods slide presents an action-centered, decontextualized, and again seemingly transparent list where Nora's presence is occluded here through agentless passive voice and ellipsis of subjects.

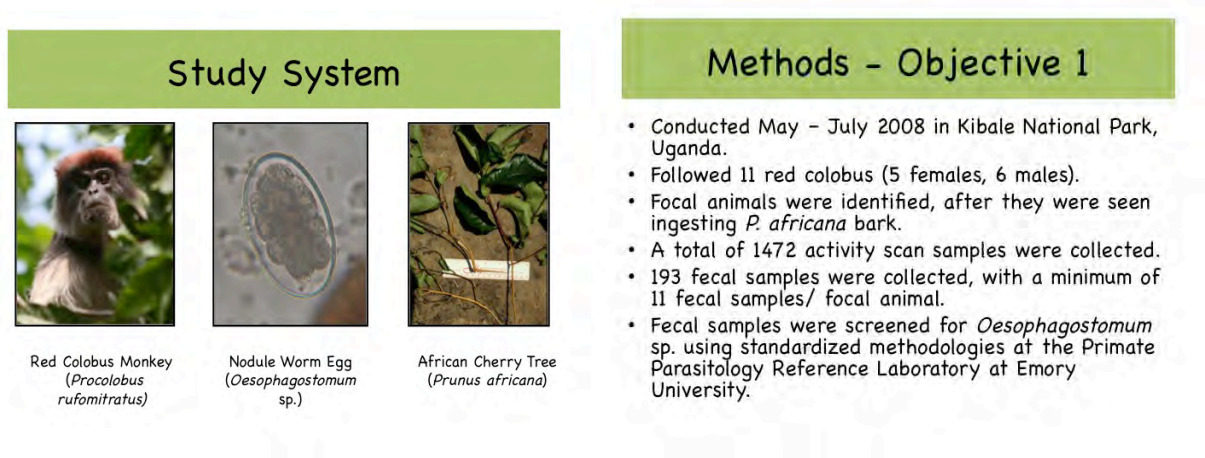


Figure 3: Two slides from Nora's presentation at the 2010 AESS Conference.

In an interview, Nora articulated what was involved in seeing self-medicating monkey, which was far from windowpane referencing of the natural world and involved a shifting cast of human and non-human characters. It included:

- seeing individual red colobus monkeys in the trees, recognizing them by attending to details of their tails, scarring on adult males, and so on, and depending heavily, particularly in the first weeks, on the expert knowledge of her field assistants, particularly Moses;
- seeing African Cherry trees in a forest of trees (again an accomplishment that initially depended heavily on field assistants);
- seeing the behaviors of individual red colobus monkeys in a behavioral scanning assay (i.e., mediated by filling out an observational protocol form that particularly concentrated on behaviors around the Prunus trees);
- seeing, appropriately handling, storing, and transporting fecal samples linked to particular red colobus monkeys for future laboratory work;
- seeing and reading inscriptions from the behavioral scans and linking them to the fecal sample labels, and
- seeing particular parasites in the microscope at Emory (when viewed through both smear and floating samples).

How did Nora learn to see in these ways and to assemble them?

In an interview, Nora pointed to a mix of sites, noting, for example, that she relied throughout her field work on the Ugandan field assistants, that she had learned to identify parasites in fecal samples from varied species around Kibale (e.g., goats and cattle as well as monkeys) when she worked in sophomore year in Gillespie's parasitology lab), but that she also had learned a kind of

patient, attentive watching eventually in family bird-watching in Michigan. She noted one key moment in her memory:

> I think it was late high school or early college when we went birding, and I remember, along Lake Michigan, you know, up to the river mouth, and that was like another point where I was like "Oh" I'm like "I'm growing up or I'm figuring this out", because I could really, I could enjoy and be calm and focused on just trying to identify the birds, sit there for a long time, and watching them, and thinking about what I see.[1]

Here again I want to note that when Nora recalled bird watching with me along the shores of Lake Michigan, she was resonating with a complexly laminated assemblage of multiple histories: ranging from multiple family experiences in the woods, on walks, and on the water that included bird watching (and studying field guides) to the colonial and capitalist project of cataloguing the earth's resources for exploitation, the growing environmental conservation movement, the rationalist science of ornithology, Western sentimentalism over a fading natural condition, and human fascinations with creatures that fly in the earth's skies, diverse motives around bird-watching "that do not line up neatly, each in its own lane, awaiting the starter's gun, but are mashed up together from the start in laminated assemblages" (Prior & Schaffner, 2011, p. 65).

Literate activity around Nora's dissertation in 2014

With her PhD work, Nora joined a lab at the University of British Columbia that focused on neuroendocrine contributions to zebra finch behaviors, and particularly focused on fast, local

[1] My backchannel responses (e.g., "yeah," "right," laughter, "um-hm," "cool") have been deleted from this transcript of Nora's comments.

synthesis of neurohormones (e.g., estradiol, oxytocin, cortisol) in the brain. Nora's interests in behavior and field work aligned with some directions the lab was pursuing, and she accepted for complex reasons, including that her boyfriend, Ben, now her husband, also a biologist, had been invited to join a lab in the same city, at Simon Fraser, and that in campus visits to departments of anthropology (for primate studies) and biology she had felt more aligned with biology. During her time at UBC, Nora was first author on two co-authored articles and two manuscripts in preparation (both of which were ultimately published in 2016), which formed the core of her dissertation (Prior, 2014) and she did field work on zebra finch at Fowler's Gap Semi-Arid Field Station in New South Wales, Australia.

I want to close with a dispersed and mundane moment focused on the text of the introduction of her dissertation. On May 28, 2014, Nora emailed a draft of the introduction of her dissertation to me, Julie, and Ben, saying in part:

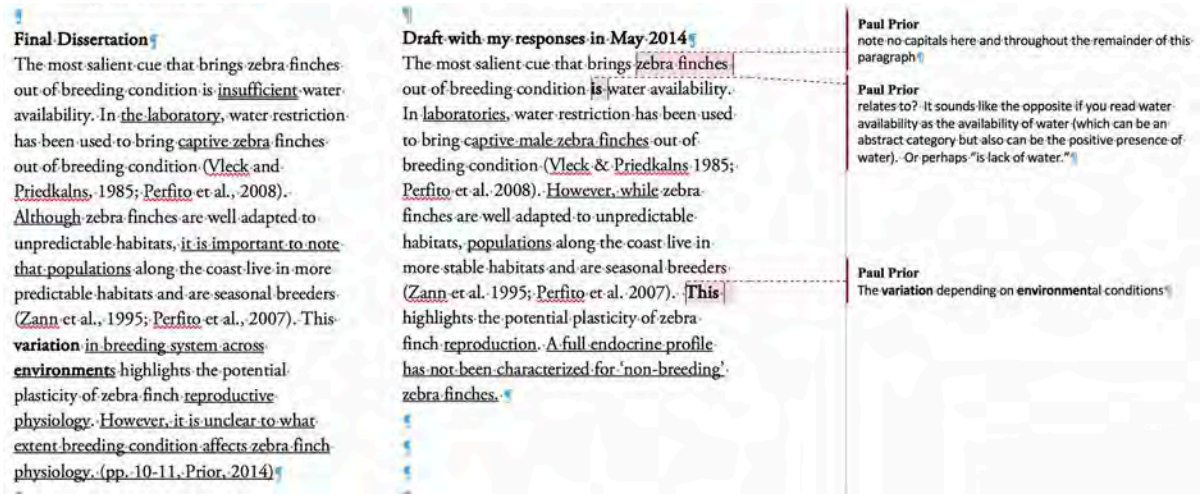
> Mom and dad, the biggest concern I have right now is the objectives... I am unsure to what extent to discuss each chapter and set up results ...
>
> Otherwise, any and all general and nit-picky comments *if* you have time

On May 30, I sent back comments on the document and some general comments in a short email:

> Hi Nora,
> The introduction looks clear and logical to me. I don't really have a feel for the genre here in the dissertation, but this feels appropriate to me.
>
> I have attached responses (and possible revisions) that really just involve word, phrase, sentence issues. The changes seem pretty simple. A lot of them are adding dates to citations or the classical issues of format consistency that crop up in dissertations as you draw on multiple texts written over time.
>
> I don't know how much you need to discuss in each summary of the chapters, but am thinking that you want to have the equivalent (in detail and claim) of a mini-abstract. I am also wondering if there should be a final paragraph about the overall contribution of the dissertation after the chapter summaries, but again you will have a better sense of the genre norm (and range) in these matters by having looked at other dissertations in this area.

> All in all, this looks great and like you're on track to finish the defense copy by next week at this time.
>
> Lots of love,
>
> D

Figure 5 displays a small bit of the editing in the text side-by-side with the final dissertation text. There were 8 changes between the May 28 draft and the final dissertation across these 5 sentences. Two of the changes were loosely related to my comments. In both cases, I noted an issue and suggested alternative language, and in both cases, Nora's revision drew on but altered my alternatives. I offer this example not to suggest that any large issues hung on this interaction but to offer a window into the occluded networks of literate practice and into the affective tone of the interactions.



Final Dissertation

The most salient cue that brings zebra finches out of breeding condition is insufficient water availability. In the laboratory, water restriction has been used to bring captive zebra finches out of breeding condition (Vleck and Priedkalns, 1985; Perfito et al., 2008). Although zebra finches are well adapted to unpredictable habitats, it is important to note that populations along the coast live in more predictable habitats and are seasonal breeders (Zann et al., 1995; Perfito et al., 2007). This **variation** in breeding system across **environments** highlights the potential plasticity of zebra finch reproductive physiology. However, it is unclear to what extent breeding condition affects zebra finch physiology. (pp. 10-11, Prior, 2014)

Draft with my responses in May 2014

The most salient cue that brings zebra finches out of breeding condition **is** water availability. In laboratories, water restriction has been used to bring captive male zebra finches out of breeding condition (Vleck & Priedkalns 1985; Perfito et al. 2008). However, while zebra finches are well adapted to unpredictable habitats, populations along the coast live in more stable habitats and are seasonal breeders (Zann et al. 1995; Perfito et al. 2007). **This** highlights the potential plasticity of zebra finch reproduction. A full endocrine profile has not been characterized for 'non-breeding' zebra finches.

Paul Prior
note no capitals here and throughout the remainder of this paragraph

Paul Prior
relates to? It sounds like the opposite if you read water availability as the availability of water (which can be an abstract category but also can be the positive presence of water). Or perhaps "is lack of water."

Paul Prior
The **variation** depending on **environmental** conditions

Figure 5: Final and Draft with comments. (To highlight change, in both texts bold marks changes from my comments, double underlining marks changes related to my comments and underlining marks other changes.)

Human *perezhivanie* is built across (not in) unremarkable as well as remarkable moments. The stretched-out series of moments indexed in these unremarkable snippets of textual exchange and change capture the iterative, dialogic reworking of voicing. Reviewing this analysis, Nora observed that these iterative engagements with particular phrasings were unremarkable but also

central to building a disciplinary voice and that settling on how to articulate specific notions becomes, over time, central to her expertise. These moments also entangle with many moments of reading, response, and conversation amidst life and are part of the texture of Nora's relationship with me, Ben, Julie, and many others who populate her world. In terms of neo-Platonic disciplinary imaginings, it is worth noting that only some people in this web would be expected. Ben is a biologist but working in very different areas. Julie is in Communication Sciences and Disorders and her work on aphasia locates her broadly in neurosciences, but not in these areas. And I am in writing studies, language and literacy education. The point is that we need to draw our maps of activities and participation empirically, not categorically, and that *perezhivanie* happens across dialogically embodied, affective, motivated, cognitive moments of semiosis, action, and becoming.

Conclusion

I conclude by noting how difficult it is to sustain a Flat CHAT assemblage perspective as our languages index neo-Platonic typifications (purifications) that sabotage it, repeatedly positing frozen generic things in unified named sociomaterial spaces. Methodologically and theoretically, such typifications invite research that examines questions like how *science* is learned through talk, text, and gesture *in* classrooms, which implies *science* is *a* thing rather than wildly dispersed evolving convergences of fluid, rhizomatic phenomena; that communication can be neatly parsed among distinct modes rather than being always and necessarily realized in diversely and fully embodied semiosis; and that social spaces (whether classrooms or disciplines) are unified and bounded spaces rather than profoundly laminated and distributed assemblages constituted by heterochronic-

heterospatial trajectories flowing across imagined boundaries with varying degrees of speed, resistance, and consequence.

Flat CHAT assemblage questions notions of education as transmission, even transmission of supposedly authentic practices like disciplinary literacies, as in the Common Core project in the US (see Prior, 2018; Durst, 2020). Instead, it suggests a focus on trajectories of semiotic becoming, that are embodied, chronotopically dispersed, mediated, laminated, and deeply dialogic. Becoming happens not *inside* domains, but *across* the many moments of a life, moments of dialogic *perezhivanie*

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