

On the Interactive Assembling of Reflective Action

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Abstract

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Reflective actions link teachers and students, pedagogies and learning. While these commonsense connections are commonplace in education research, the learning sciences have yet to produce either a theory or an analysis of ‘reflective action’ (RA) as an interactive phenomenon endogenously utilized by interactants as a resource for “onto-epistemological navigations” along interaction trajectories during situated learning activities. This dissertation sets out to address this gap. Drawing on the theory that learning is mediated by its situated assembling and webbing across layers of social inter- and intra-action, I build on frameworks positioning *all* action as emplaced and contextualized, socially distributed, and historically situated, to argue that it is *also* reflective along a malleable, non-binary continuum ranging from *autonomic* to *autonomic-and-deliberate*. Framing pedagogical communications and reflective discourses as specific caregiver and educator practices of reflective action, respectively, I adduce

empirical findings to support conceptualizing “reflective discourse” (RD) as a set of pedagogical micro-practices that harness the inherent structure of human communication for educational purposes. To advance this position, I conduct interaction analysis on data collected from a community-shaped, design-based study of I-STEAM LARP (Indigenous Scientific Technological Artistic Mathematical Live Action Role-Play) to map if and how interactants expressed RA. The key finding, developed across three interdependent sub-findings, is that the plastic structure of RA made it a malleable interactive resource for laminating layers of onto-epistemic meaning onto I-STEAM LARP substrates through a process which I identify as “reflective discourse *chaining*.” Implications include recommendations for how reflective practitioners can make RAs publicly visible through the micro-practices of RD; a new theoretical framework for analyzing RA as a plastic and malleable interactive resource that adapts well for teaching-and-learning by virtue of its contingent and ostensive markings; methodological inroads to marking the presence of RA using a five-component coding scheme; and a novel analytic framework for analyzing educational discourses that shifts from the frames of IRE/F to the frames of RD to analyze how interactants participating in teaching-and-learning activities collectively web and accumulate meaning and understanding.

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Chapter One: Introduction

Statement of Purpose

The purpose of this research is to contribute to an ethic of *care* (Noddings, 2013) in educational research and pedagogical practices that affords optimal learning. Caring pedagogical practices are contingently responsive to the situational emergence of learning, geographically attuned to lands and waters enlacing learning, and culturally sensitive to power dynamics and participant historicity shaping learning potentials. However, this ambitious purpose cannot be accomplished in a single dissertation, so I have focused on a single pedagogical practice that appears to reflect human caregiving: Cognitive-developmental theory suggests that interactants harness the micro-practices characteristic of “pedagogical communications” (Csibra & Gergely, 2009, 2011; Gergely, 2007) in a process I call *reflective action* (RA), to build up particular learning densities across interactive “substrates” (Goodwin, 2018), layering cultural knowledge systems over time (Csibra & Gergely, 2009); these micro-practices consist of contingent and ostensive markings that invite collective reflective, informative, and pedagogical actions. The short version of the two-part research question I pursue here is: Is this the case from the perspective of interactants? And if so, how do interactants do this? In this paper, I set out to analyze the conjecture that interactants socially distribute RA by harnessing the micro-practices of “pedagogical communications” to transform their interactive substrates during “onto-epistemic navigations” (Bang, 2015; Marin & Bang 2018) along interactive trajectories of designed learning activities. Given the practical and designed contexts of the analyzed interactions (see de los Angeles, 2016), analysis includes analyzing RA across cycles of play-and-reflection (Salmon, 2016) and in chains of reflective discourse (RD; Cobb, Boufi, McClain, & Whitenack, 1997).

Statement of Problem

Numerous studies of learning have linked play to reflection in learning processes (e.g., Bakkenes, Vermunt, & Wubbels, 2010; Bloom, 1956; Boud, Keogh, & Walker, 1985; Brown, Bransford, Ferrara, & Campione, 1983; Flower & Hayes, 1980; Rothkopf, 1966). In particular, studies of early childhood learning and development point to how pretense and role-play interactions are effective pedagogical resources for aligning interactant intentionalities toward particular teaching-and-learning trajectories (e.g., Cohen, 2011; Corsaro, 2003; Fein, 1987; Ferholt, 2007; Fonagy & Target, 1997; Giffin, 1990; Lindqvist, 1996; Sawyer, 1996; Simmons, 2014). The learning sciences, however, currently have, at best, partial frameworks for analyzing the endogenous, situated, and interactive assembling of reflective action (RA), including the RA of play-and-reflection during pedagogical interactions. Analytic frameworks not oriented toward the endogenous assembling of social and situated interaction risk slipping into reified agent-structure dialectics in which either ‘freedom’ (e.g. de Freitas, 2013) or ‘sociocultural determinations’ (e.g., Goode, 1994; Mechling, 1989; Leggett & Newman, 2017; Mitchell & Thompson, 1990) are privileged in conceptualizing and analyzing RA. Such frameworks appear to project the problems of agency implied by standing above and outside the data to analyze it into their interpretations of agency in the data itself (Shotter, 2006). By orienting to endogenous meaning-making processes of interactants, analysts shift frames from their own agentic tensions to the agentic tensions negotiated by interactants themselves, whether they be about freedom and determination, or something else altogether (Stevens, 2010). The problem of shifting perspective in framing analysis of RA can be summarized as two gaps in learning sciences research, one general and one specific:

Gap 1. Generally, the learning sciences have yet to develop analytic accounts of the interactive assembling of RA from the perspective of interactants.

Gap 2. Specifically, the learning sciences have yet to produce interactive analytic accounts of how interactants utilize the micro-practices of RA during situated reflective discourses and play-and-reflection.

Overview of Study

In various learning theories, reflective processes are considered indispensable to teaching and learning (e.g., Bakkenes et al., 2010; Bloom, 1956; Boud et al., 1985; Brown et al., 1983; Flower & Hayes, 1980; Rothkopf, 1966). In research on pedagogies, *reflective practice* is widely acknowledged as a pivotal practice for any educator (Baker, 2014; Pleschová & McAlpine, 2016; Schön, 1983, 1987; Vallance, 2008; Wood & Bennett, 2000; Zeichner & Liston, 2013). In conjoining the worlds of pedagogy and learning, the *learning sciences* have begun to demonstrate how *reflective discourses* (RD) link reflective practices to *reflective learning* (Cobb et al., 1997; van Zee & Minstrell, 1997). This study dwells in the overlapping space between pedagogy and learning, zooming in on and analyzing how the reflective actions (RAs) of pedagogical interactions help mediate onto-epistemic navigations (Bang, 2015; Marin & Bang, 2018) across designed learning activities. This is a complex and ambitious dwelling, and thus the purpose of this dissertation is twofold:

- 1) to analyze how RA is socially distributed in activities designed for cultivating pedagogical interactions
- 2) to map how interactants harness the capacities of RA to navigate the semiotic fields of socially distributed onto-epistemic webbing and assembling during designed learning activities in order to navigate an activity trajectory

Some social interaction theories posit that certain elements of social interaction are present in all interactions, with those same elements having variable expressions according to situational, geographical, and/or cultural contingencies (e.g., Bateson, 1972; Goffman, 1974). Some cognitive developmental theories posit that reflective functioning (RF; Tessier, Normandin, Ensink, & Fonagy, 2016), or mentalization (Leslie, 1987), is developed and expressed through play-and-reflection. Theories of “pedagogical communication” (Csibra & Gergely, 2009, 2011; Gergely, 2007) posit that pedagogical interactions are comprised of *contingent responsivity*, *contingency marking*, *contingency detection*, *ostensive marking*, *decoupling*, and *referential communications*. Some theories on play-and-reflection propose that interactants use play to harness *and* (re)produce the structural resources (layered assembling) of social interaction for playful activities, and that such resources in turn are potential pivots, anchors, or substrates for RA (e.g., Fler, 2011; Salmon, 2016). To analyze these theoretical claims, I adopted an interactionist frame of learning (Hall & Stevens, 2015)—for its empirical grounding, theoretical framing, and methodological affordances—and utilized interaction analysis (IA) toolkits (Jordan & Henderson, 1995) to analyze empirical data for evidence of how interactants engaged reflective processes, both through play and without play, affording pursuit of two empirically driven research questions.

RQ 1: How is reflective action (RA) socially distributed in activities designed for cultivating pedagogical interactions during I-STEAM LARP?

RQ 2: How do interactants harness the capacities of RA to navigate trajectories of socially assembled onto-epistemic webbings of semiotic fields during designed learning activities?

Analytic Process

To develop understanding of the interactive assembling of playful and reflective action, I developed an analytic framework based on the theory of pedagogical communication (Csibra & Gergely, 2009; Gergely, 2007) to conduct interaction analysis (IA) of the situated assembling of reflective discourses (RDs), predominantly (though not exclusively) through play-and-reflection. My intention was not to map this framework onto the data, but rather to utilize IA to explore the conjecture that interactants harness the structural features of co-operative action (Goodwin, 2018) for RA navigating various onto-epistemic trajectories. Thus, only those elements of contexts that could be demonstrated as relevant to interactants could be advanced as evidence of RD and play-and-reflection (Schegloff, 2007). While my own theoretical interest was to develop frameworks for studying how RA, RD, and play-and-reflection are assembled, methodologically I was bound to analyzing whether indeed these frameworks reflected members' phenomena (Stevens, 2010). Prior literature provided historical, precedent suggestions on what interactants may be up to, but only through IA could I find evidence to support or rejects such suggestions.

Summary of Findings

Empirical findings in this study are presented in three inter-related parts. Taken together, these findings provide an interactive analytic account of how interactants harnessed the *contingent-ostensive* laminatory powers of RA to chain together macro-cycles of semiotic action during onto-epistemic navigations (Bang, 2015; Marin & Bang, 2018) of I-STEAM LARP activities.

- Finding 1a: The Socially Distributed Structure of RA (unit of analysis)
- Finding 1b: The Socially Distributed Structure of Chaining RA
- Finding 1c: The Semiotic Action of I-STEAM LARP through Chaining RA

Interaction analysis (IA) allowed me to analyze how RA both emerged from and afforded onto-epistemic navigation along interaction trajectories during designed learning activities. On the one hand, IA mapped how activity frameworks, design intentions of learning environments, phatic connections, cultural orientations, power distributions, situational contingencies, and participation structures (at a minimum) shaped the situated layering of playful and reflective actions. On the other hand, IA mapped how interactants harnessed the ever-varying social distributions of the mechanisms of RA to navigate learning activities designed to mediate exploring their *lived-world* ecosystems (viz., actual-physical ecosystems) through live-action role-play (LARP). IA revealed how interactants laminated contingent and ostensive signals of relatively playful and reflective processes as they drew on cultural-historical, powered, and emplaced dynamics to navigate interaction trajectories of designed learning activities. Through doubly-laminating chains— indexing *recently past* contingent-ostensive messages with *current* contingent-ostensive signaling—interactants cultivated the capacities of *co-operative action* (Goodwin, 2018) for *joint collaborative actions* (Sebanz, Bekkering, & Knoblich, 2006) oriented toward I-STEAM LARP values and practices that foregrounded Indigenous ways-of-knowing (IWOK) and epistemic heterogeneity.

Background

The phenomenon of ‘pedagogical interaction’ (teaching-and-learning) is theorized here as highly plastic and variable, manifesting in situated interactions according to situational contingencies. For this reason, it has been called many names by scholars investigating the phenomenon (see Figure 1):

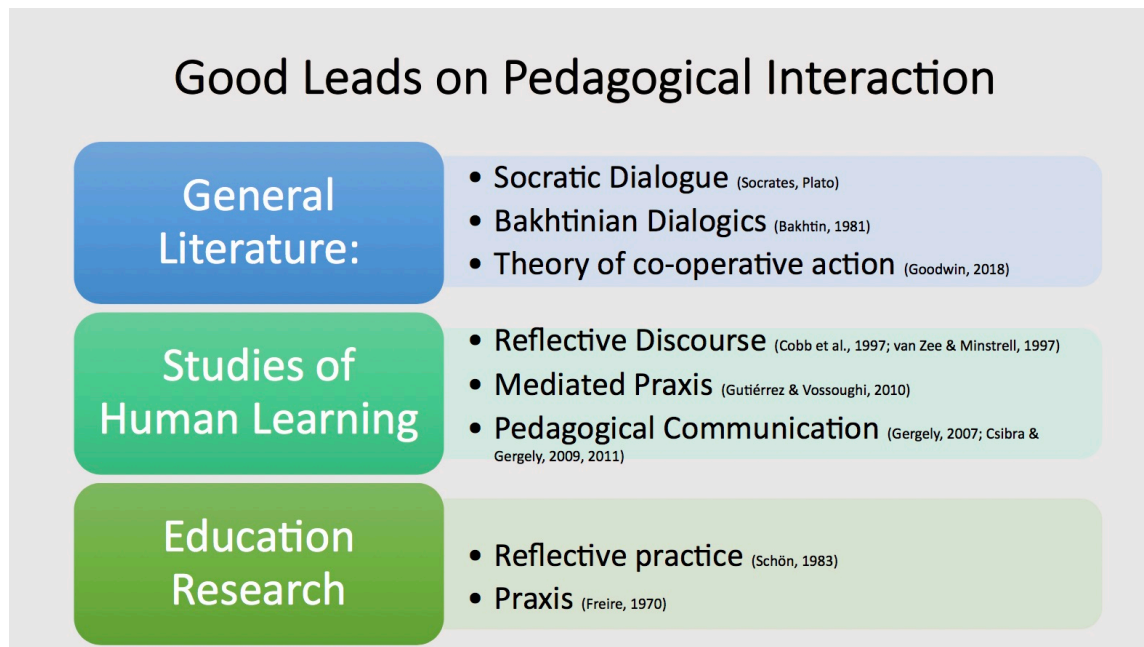


Figure 1. Research leads

The theory of pedagogical communication (Csibra & Gergely, 2009, 2011; Gergely, 2007) provides a potentially insightful thesis into the pervasiveness of pedagogical interactions. In this theory, the human capacity to teach and learn from each other is biologically wired into the species, thus a pan-human capacity. Furthermore, this specific capacity is credited for the propagation of culture and knowledge from generation to generation, generating the never-ending expansion of knowledge and diversity of cultures. In other words, according to this theory, pedagogical interactions are where biology meets culture, where biological affordances are harnessed toward cultural and epistemic development. This interactive pedagogical framework affirms that all knowledge is culturally situated, and thus all learning of knowledge is also learning of a culture. Such orientations linking the time-scales of biology and culture to knowledge, learning, and development resonate with influential frameworks in the learning sciences that make similar connections (e.g., Cole, 2006; Rakoczy & Tomasello, 2007; Tomasello & Rakoczy, 2003; Tomasello, Carpenter, Call, Behne, & Moll, 2005).

This dissertation sets out to explore the phenomenon of pedagogical interaction, both for its plastic variability that allows it to appear in so many forms, as well as its phenomenological coherence that resonates across all its instantiations. In a very literal sense, this phenomenon is co-extensive with the plasticity of nervous systems, whose plasticity is also central to human learning. Indeed, the effect of every interaction is also effected in the nervous systems of interactants, which is to say embodiment and interaction go hand in hand. However, this dissertation does not attempt to flesh out a dual-aspect theory of learning (both embodied and interactive), but rather admits such a theory while focusing predominantly on its interactive aspect (which necessarily entails some but not all embodiment processes).

Implicit to the argumentative logoi of this dissertation is a theory of how general phenomena and specific instantiations are related. Plasticity, potentiality, resonance, and variability are the logoi of how general and specific are related, rather than types, categorization, deduction, and induction. While pedagogical interaction may refer to a general phenomenon that appears in ever-variable manifestations, those particular manifestations themselves appear to analysts as specific forms. Generality, then, refers to that which resonates across all instantiations, in this case ‘pedagogical interaction’. However, analytically speaking, what is general and what is particular are themselves relative to each other. For example, in the second part of this dissertation, where I analyze data, I will frame many of the phenomenal appearances of pedagogical interactions (general) as ‘play-and-reflection’ (specific). However, at another scale, more specific than play-and-reflection, I will analyze phenomena that appear across situated instantiations in designed role-play, uniquely suited to their instantiated appearances. In short, play-in-reflection becomes generalized across these findings (cohered by

phenomenological resonances), while the new unique instantiations present a here-to-fore unnamed specificity: play-and-reflection in the service of learning I-STEAM during LARP.

Rather than attempting to show exceptions to ‘pedagogical interaction’ or ‘play-and-reflection’ models, the intent here is to further reveal the phenomenological plasticity and variability of the phenomena of interest. As new phenomenological vectors of analysis become apparent, this does not have to undermine other models or conceptions, but rather reveals potential dimensions that variably activate according to interactant needs and may be present but just not salient for certain analytic endeavors—for reasons related to methodology, or even politics and power. In short, the aim of this dissertation is an expansion of the analytic understanding pedagogical interactions through examination of uniquely variable instantiations of situated reflective actions (RAs), particularly during play-and-reflection.

Research Design

Given the theoretical privileging of situative, interactive, and cultural-historical processes in how interactants meaningfully engage play and RA, the contextual specifics of the data selected in this study are not factors to be abstracted out or controlled for, but rather provide the insights needed into how context is locally assembled (continually) and how RAs are meaningfully layered into interactions from the perspectives of interactants. The rich contexts of this study provide the precisely situative nature of RA that is necessary to help elucidate its continuous variation. Thus, the details of the context—including its situativity in a summer learning camp that utilized LARP of the local ecosystem as one means (among many) designed for developing onto-epistemic and axiological sensitivities to the Indigenous and heterogenous knowledge systems of I-STEAM—are not epiphenomena that need to be controlled in order to abstract some universal model of RA or play-and-reflection. Instead, the layering of play-and-

reflection for the purposes of learning about the local ecosystem, and ecosystems more broadly, reveals the authenticity of how RA is always situated toward particular intentions of involved interactants. While there are theoretically compelling reasons to study reflection as it interactively emerges in relation to play substrates, which will be discussed later in chapter three, studying RA as it emerges in the context of designed role-play does not compromise the attempt to develop a clean model of reflective pedagogical interactions, because no such clean model exists—or rather a clean model would be more problematic than helpful. Clean models of RA are problematic because they reduce the situated complexity out the process and thus lose access to the lived experience of educational practitioners who must ultimately benefit from research like this. The framework here is grounded in the assumption that learning experiences are mediated in continually varying contexts, sensitive to cross-situational, cross-geographic, and cross-cultural variability (at a minimum). In addition to being theoretically valuable, the findings of this study must be practically valuable, such as a revealing a pedagogical toolkit of micro-practices that education practitioners can adopt and adapt to enhance their cultural, geographical, and situational sensitivity.

Paper Organization

In the second chapter of this study, I review the literature linking RA to learning. In the third chapter I, I review literature linking play, reflection, and learning, and I provide a theoretical framework for conceptualizing the interactive assembling of play-and-reflection. In the fourth chapter, I develop a theoretical framework for conceptualizing the situative and interactive assembling of RA, including conceptualizing how RA is built out of interactive resources and how RA in turn is used as an interactive resource. In chapter five, I present the data collected and analyzed from two design iterations of I-STEAM LARP along with the

analytic framework and toolkits I used to analyze the data. In the sixth chapter, I summarize my findings from the analysis (which itself is presented in full detail in Appendices B, E, and F), highlighting how interactants harness particular features of social interaction and RD to chain together macro-cycles of RA into expansive webs of I-STEAM LARP understanding and practice. In the final chapter, I will review the research questions and distill out contributions to theory, methodology, design and practice from this study. I close with final reflections about cautions to my findings and future directions to consider.

Chapter Two: Literature Review of Reflective Action

Overview of Reflective Action

Why Reflection?

A basic premise of learning, drawn broadly in contemporary research on learning from the works of John Dewey (1910, 1933/1998), and traceable to and through Indigenous peoples (Cajete, 1998, 2005), and repeatedly explored by researchers of human learning is that *experience, coupled with reflection upon that experience, leads to learning* (e.g., Dohn, 2011; Kolb, 1984; Rose, 2013; Schön, 1983, 1987). In his influential writings about reflection, Dewey (1910, 1933/1998) positioned reflection as a deliberate mental action that transforms impulses into intelligent action. Dewey's (1910) model of *reflective action* (RA) begins with an uncertainty-inducing disruption to ordinary lived experience, followed by exploration and consideration of possible meanings, evaluated by reasoning, and tested by further observation. Indeed, RA appears to Dewey as a kind of scientific method.

Numerous studies since Dewey's time have foregrounded the importance of reflection to the learning process (e.g., Bakkenes et al., 2010; Bloom, 1956; Boud et al., 1985; Brown et al., 1983; Flower & Hayes, 1980; Rothkopf, 1966). In cognitive research, RA generally entails egocentric metacognitive actions including planning, monitoring, evaluating, and regulating one's own body, emotions, and thoughts (e.g., Brown et al., 1983; Costa & Kallick, 2000; Flavell, 1979; Hacker, 1998; Maki, Shields, Wheeler, & Zacchilli, 2005; White & Fredericksen, 1998). However, while these metacognitive capacities are oriented toward taking one's self as the object of reflection (i.e., egocentric), they are developed in environments that are social and cultural (Vygotsky, 1987). Self-monitoring, for example, which has been linked to high performance on learning tasks when developed (Chi, Bassok, Lewis, Reimann, & Glaser, 1989;

Recker & Pirolli, 1995), can be difficult for learners to achieve alone (Hacker, 1998). Peer interactions mediating reflection have been linked to successes in physiology (King, 1994) and photosynthesis (Coleman, 1998). Social mediations of reflection in formal learning environments appear so pervasive that Davis (2003) and Roscoe and Chi (2008) expansively frame reflection as an action of *sense-making*, expanding from *ego-reflection* to *content-reflection*. RA, framed in practice as a process of sense-making, has been positively correlated with improvements in physics problem-solving (Chi et al., 1989) and conceptual understanding of circulatory systems (Chi, De Leeuw, Chiu, & LaVancher, 1994).

What is Reflection?

Phenomenologically, reflection is an integral part of the situated act of learning in real-time about the ever-unfolding dynamic space-time life-worlds of conscious beings (Zaner, 2010; Zahavi, 2003). In classical phenomenology (Zahavi, 2003), RA entails conscious subjects directing their consciousness toward intentional objects, including other subjects that can become objects and objects that can become subjects (Merleau-Ponty, 1968/2012). Davis (2003) identifies intentional objects of reflection as physical objects, actions, activities, projects, and knowledge. Other studies have identified feelings, thoughts, experience, perceptions, social positioning, and power as objects of self-reflection (e.g., Fonagy, Gergely, and Target, 2002; Zeichner & Liston, 2013).

The classic phenomenologies of reflection, however, have been faulted for appearing overly individualistic in their rendering of RA, reflecting the *majoritarian* (Deleuze & Guattari, 1975/1986) cultural lens in the West that privileges individualism. Post-phenomenological critiques pivoting on critical genealogies of cultural-history have revealed how operational meanings of RA hinge on culturally variable meanings of self, subject, object, individual, and

collective (e.g., Dohn, 2011). All of these variable sociocultural constructions shape how RA is understood and enacted for situated action. The extent to which reflection is socially mediated suggests that it is more than just an introspective process, that RA is a social process irreducible to individualistic processes. In a learning sciences study on reflective thinking, Lehrer and colleagues found evidence that reflection among children traceable to individual performance improvement was inseparably concomitant with increased complexity of group interactions:

At the social level, reflective thinking was promoted and supported by a classroom of designers—not a mere collection of people, but an orchestrated repertoire of socially oriented practices, including teacher mentoring, a sense of audience, and a historic relation between convention and invention. Therefore, reflection was a form of mediated activity, sustained by an ensemble of tools and nurtured by specific forms of teaching (and peer) assistance. (Lehrer, Lee, & Jeong, 1999, p. 278)

A demonstration of the situative and interactive complexity in assembling collective reflection can be found in Roscoe & Chi's (2008) study on the effectiveness of reflective prompting in peer-to-peer tutoring among undergraduates. In their study, three groups of 10 undergraduates were placed into one of three conditions: tutoring another undergraduate (interaction condition), making a video tutorial with no interaction, and studying alone with the explicit prompt to reflect aloud as they study. They found that individuals who had been prompted to engage in reflective verbalizations as they studied a text on their own exhibited more RA, produced better measured understanding of the text, and felt greater autonomy than the students in the other two conditions. This is not to say, however, that studying alone is superior to teaching another. Specifically, the *prompt to reflect aloud* appeared to make the difference. Other studies have found that students who were primed to learn a text in order to teach another

student outperformed students who were primed to learn a text to be tested but *were not prompted to reflect aloud* as they studied (e.g., Annis, 1983; Bargh & Schul, 1980; Benware & Deci, 1984).

The Roscoe and Chi study also illustrates how *contingent relationality* may mediate learning outcomes. Tutors able to interact with their tutees exhibited more RA than those who produced a video for an unknown tutee. These are two different webbing of knowledge, assembled through different participation structures and different distributions of power and agency. Research has shown how young humans learn more effectively and efficiently through contingently responsive real-time interactions than through watching educational videos exploring the same learning content (Conboy, Brooks, Meltzoff & Kuhl, 2015).

The relatively *equitable distribution of power* across an assembling of social actors also affects the onto-epistemic webbing of RA. Again, in Roscoe & Chi's (2008) analysis, tutor-tutee reflective activity was scored *higher* when *tutees* initiated new topics with questions than when tutors initiated new topics, though tutors initiated at much higher frequencies. Indeed, contrary to canonical models of the zone of proximal development (ZPD), in which learning is driven by the scaffolds provided by a more-knowledgeable-other's knowledge (e.g., Vygotsky, 1930-1934/1978), the efficacy of tutee questions in driving reflective knowledge-building dialogues has been demonstrated in numerous studies (e.g., Bargh & Schul, 1980; Cohen, 1986; Foot & Barron, 1990; King, Staffieri, & Adalgais, 1998; Roscoe & Chi, 2008; Schön, 1987), a finding recently affirmed again in parent-child Indigenous environmental observation practices (Marin & Bang, 2018).

Roscoe and Chi (2008) also examined the quality of reflective prompts and they found that reflective knowledge building during dyadic tutoring was greatest when question types were

“deep” as opposed to “shallow.” Deep questions prompting learning through reflection were those that elicited elaboration, inference explication, and explicit reasoning (e.g., Hamaker, 1986; Peeverly & Wood, 2001). A growing amount of research suggests that (1) RA significantly increases with material or discursive prompting and mediation (e.g., Ayling, 2012; Cobb et al., 1997; Davis, 2003; van Zee & Minstrell, 1997; Mirzeoğlu, 2014; Walker, 2015) and (2) that *open-ended* mediations (materials and discursive prompts) are more effective at initiating reflective processes than *canalizing* mediations that prompt specific reflective pathways (Davis, 2003; Walker, 2015). This may be because, as numerous studies have argued theoretically and empirically, learner autonomy is pivotal to RA (Garris, Ahlers, & Driskell, 2002; Otsuka & Jay, 2017; Thompson et al., 2010; Van Dijk, Van der Sluis, Van Dijk, & Bongers, 2015; Wood & Bennett, 2000; Wilson, Mack, & Grattan, 2008). Davis (2003), for example, has found an empirical correlation between student autonomy and open-ended reflection prompts, suggesting that autonomous students respond better to the open-endedness of prompts that honor their autonomy. Davis speculates that generic prompts afford learners a more flexible and personalized entry into their ZPD.

In short, research on the social activation of RA appears to be revealing that RA is optimized when semiotic-material mediations prompting RA are open and amenable to learner intentionality, which is constructed through social demarcations and distributions of agency. In other words, open-ness affords greater collective alignment with learner agency, rather than open-ness for the sake of open-ness (Tomasello & Rakoczy 2003). How do educators prompt reflection to optimally align with learner agency? I now turn research on educator reflective practices to begin thinking about this question.

Reflective Practice

The construct of *reflective practice* has been of primary interest over the last three decades in medical, nursing, social work, professional development, leadership, and teacher education fields, where expert actions involve rapid perception of complex situations that cannot be fully anticipated by prior knowledge (e.g., Carr & Kemmis, 1986; Fisher, Turesky & Gallagher, 2011; Hendricks, Mooney, & Berry, 1996; Moon, 1999; Parsell, Spalding, & Bligh, 1998; Zeichner & Liston, 2013). Such fields consider how reflection can be a central resource available to help practitioners think through the local circumstances of situated experience. In teacher education literature, reflection has been framed as a process by which disparate events, experiences, and feelings are integrated into ever-growing understanding of a teacher's professional identity (e.g. Zeichner & Liston, 2013). For education practitioners learning reflective practices, reflective action (RA) is framed as a problem-solving, meaning-making process (e.g., Davis, 2003; Lehrer et al., 1999; Zeichner & Liston, 2013; Schön, 1983, 1987). Explicit development of reflective practices has helped prospective teachers transform their theories of teaching and learning (Wood & Bennett, 2000), including from knowledge instruction to construction (Vallance, 2008), from teacher-centered to learner-centered pedagogy (Pleschová & McAlpine, 2016), from play-as-reward to play-as learning (Baker, 2014), and from Piagetian to Vygostkian orientations toward learning (Wood & Bennett, 1998).

History of the Idea: “Reflective Practice”

Donald Schön (1983) conceptualized “reflective practice” in terms of two spatiotemporal relations between action and its reflection: one inseparable from the present moment (reflection-in-action) and one severable into past or future (reflection-on-action). In most academic conceptions of reflection, according to Schön in 1983, reflection was viewed only in terms of its

spatiotemporal severability from the action upon which it reflected. Schön conceived of *reflection-in-action* to express the spatiotemporally *immediate* connection between reflection and action. Reflection-in-action occurs in “uncertain or unique” situations and is triggered by affects that resist facile cognitive assimilation and demand re-assessment of “prior understandings” and any “change in the situation” (p. 68). Schön outlined how failing to see the relation of reflection and action in terms of spatiotemporal inseverability had led academics and researchers to believe that theorizing and practice took place in entirely different environments. This belief had given rise to a problematic gap that had to be bridged by training practitioners, such as teachers, to apply theories developed by researchers (Schön, 1983; Zeichner & Liston, 2013). Contrary to this widespread view, Schön (1983) argued that through reflection-in-action practitioners construct their own local theories about problems in practice *as encountered* in situated interactions. The reflective practitioner “does not keep means and ends separate but defines them *interactively* as he [sic] *frames* a problematic *situation*” (p. 68, emphasis added). For Schön, the *interactive framing* of a situation is directly linked to reflective capacity and action.

Schön’s conception of reflective thinking explicitly draws from Dewey’s writings on experience and reflection (Schön, 1992), for whom reflective thought entails “the intentional endeavor to discover specific connections between something which we do and the consequences which result, so that the two become continuous” (Dewey, 1916, p. 157). In other words, reflective thought appears to entail a deliberate focusing on what helps one to see onto-epistemological links between *felt-affects* and *actions*, on one hand, and *actions motivated by affects* and their *consequences*, on the other. What is less clear in Deweyan and Schönian framing, however, is the roles of one’s cultural-history and powered social positioning in mediating one’s reflective capacity to see these links (e.g., Bang, 2015; Gutiérrez & Arzubiaga,

2012; Gutiérrez & Vossoughi, 2010; Nasir & Hand, 2006; Nasir, Roseberry, Warren, & Lee, 2006; Saxe & Esmonde, 2005). In other words, what is the relation of situated values and affects—already in motion (Løndal, 2011; Thurtle, 2014)—to the kinds of reflection-in-action that are possible in a given situation?

These are not the only ambiguities in the Deweyan and Schönian framings of reflective thinking and reflective practice, which have had a pervasive influence on reflective practice research from the 1980's to the early 2000's (Zeichner & Liston, 2013). Education researchers using phenomenological methods to analyze lived-experience and the relation of reflection and action have critiqued how ambiguities in classical frames of reflective practice have led to contemporary *cognitive-rationalist* interpretations that frame reflection-in-action as a regulative, metacognitive process, taking place inside the minds of practitioners, instilling order and control over one's affective drives and cognitive dilemmas through rational thought (e.g., Bleakley, 1999; Dohn, 2011; Done & Knowler, 2011; Erlandson, 2005, 2006; Felten, Gilchrist, & Darby, 2006; Johansson & Kroksmark, 2004; Jordi, 2011; Sykes & Dean, 2013; Vagle, 2006; van Woerkom, 2010). In this sense, reflection-in-action has been framed as a process that stands 'over and above' action and that can be conceptualized through a series of language-based how-to-reflect propositions (Dohn, 2011). As a result of such a conception of RA, studies and practices of reflective practice tend to focus on developing lists of internally discursive 'moves' that reflective practitioners can make *in their minds*, such as the kinds of questions that teachers *can ask themselves* in order to improve their reflective practices (see Zeichner & Liston, 2013).

Methodologically, such studies predominantly rely on after-the-fact reflections-on-action by teachers through interviews and journaling, conflating reflection-on-action and reflection-in-action in order to use the former to make empirical and theoretical claims about the latter. Losing

sight of Schön's original insights, such methodologies assume that a delay between reflection and the experience reflected upon is unproblematic for conceptualizing the role of reflection during the original experience (e.g. Bolin, 1990; Clarke, 1995; Doyle & Holm, 1998; Kettle & Sellars, 1996; Castle, 1997; Rodgers & Dunn, 1997). According to Dohn (2011), such methodologies fail to provide an account of the complex transformations that take place between original reflections-in-action and subsequent elicited reflections-on-action.

To address these conceptual and methodological problems in studying reflection, studies adopting a *contemporary* (as opposed to classic) phenomenological perspective have proposed a variety of definitions of reflective practice that varyingly foreground the *situated and socially distributed* nature of practice (Dohn, 2011; Sykes & Dean, 2013; Vagle, 2006), the paralinguistic and affective *signals* emitted by students in educational settings (Dohn, 2011; Johansson & Kroksmark, 2004; Sykes & Dean, 2013), and the *feelings and intuitions* used by educators to detect signals emitted in educational situations (Johansson & Kroksmark, 2004; Yorks & Kasl, 2002; cf. Ruddick, 1989; Zeichner & Liston, 2013). In these contemporary phenomenological critiques, reflection is framed as a socially distributed and collective alignment of primary intersubjectivities affording the emergence of secondary intersubjectivities that develop knowledge (information, references, etc.). Aligning primary intersubjectivity is a complex interactive process involving exchanges of verbal and affective signals that modulate the connections holding interactions together. Certain alignments of primary intersubjectivities afford the emergence of secondary intersubjectivity, the interactive grounds for referential and reflective communications (Sidnell, 2014). Following these arguments, analysts interested in learning about reflection-in-action must follow the intersubjective modulations of social interaction as displayed by interactants to each other.

Collective Reflective Discourse

The turn to the social interactive mediation of reflective processes reveals untapped resources for reflecting that are available to the everyday practices of educators. Indeed, numerous studies on classroom discourse appear to demonstrate how thinking of reflection in terms of its social distribution can be of significant value to education practices (e.g. Barron, 2000; Elizabeth, Anderson, Snow, & Selman, 2012; Enyedy & Goldberg, 2004; Forman & Ansell, 2002; Gutiérrez, Rymes, & Larson, 1995). Studying math classroom discourses, Cobb and colleagues (1997) have proposed conceptualizing “reflective discourse” (RD) as an alternative framing of RA, away from the focus on reflection as a process in the mind of an individual and toward focusing on reflection as a socially distributed process between speakers and addressees. Cobb and colleagues outlined a process whereby teachers and students generated mathematical objects which they could then reflect on as they generalized to higher levels of abstraction. Teacher-student discourse mediated “collective reflection,” the “joint or communal activity of making *what was previously done in action* an object of reflection” (p. 258, emphasis added). In short, RD was observed as an interactional accomplishment comprised of a teacher who proactively guided and students who actively contributed to the discourse, taking “what was previously done in action” as the “object” of RD.

This conception of RD draws on Piaget’s (1972) account of “reflective abstraction,” in which “action itself becomes an entity that can be conceptually manipulated” (Cobb et al., 1997, p. 259). Following this line of thinking, RD proceeds in two phases in which the first phase elicits *semiotic-material* signs (detectable by the senses) that subsequently become the *object for reflection* (semiotic action) in the second phase. The authors emphasize that these two phases are linked by a “shift,” typically (though not necessarily) introduced by the teacher. The *shift* is

brought about by a *pedagogical move*, such as a *question* that acts as “an invitation, or an offer, to step back and reorganize what had been done thus far” (p. 269)¹. The two phases appear analogous to how Ackerman (1996) describes “diving in” and “stepping out” as driving cognitive growth.

Through the *ontological innovation* (diSessa & Cobb, 2004) of RD, Cobb and colleagues make several significant contributions to how RA and reflective practice are conceptualized together. RD is a form of reflective practice that discursively distributes two phases of RA across teachers *and* students. Thus, across contemporary research on learning and reflection, pedagogy and reflection, and discourse and reflection, a convergent theme links RA to its social, public, and interactive mediation. This convergent theme should not be too surprising to learning scientists, given that from a Vygotskian perspective human development progresses as a process of internalizing what starts out as socially mediated and external (Vygotsky, 1930-1934/1978). Indeed, contemporary research in developmental cognitive psychology suggests that RD may first emerge developmentally as a set of micro-practices that are present wherever humans communicate pedagogically (Csibra & Gergely, 2009, 2011; Little, Carver, & Legare, 2016). Regardless of context, these micro-practices involve manipulating spatial, temporal, or intensive dimensions of the sense-modality mediation of interaction (Csibra & Gergely, 2009, 2011). However, in their contextualized enactment, these micro-practices vary according to signature or generic organizations of space, time, and intensity that produce and re-produce particular cultural practices (Little et al., 2016). Furthermore, following the theoretical leads in sociocultural learning theory, variations in RD micro-practices are likely driven by culture, power, and historicity that shape the phatic affordances of interactions and in turn their reflective potentials

(e.g., Bang, 2015; Gutiérrez & Arzubiaga, 2012; Gutiérrez & Vossoughi, 2010; Nasir & Hand, 2006; Nasir et al., 2006; Saxe & Esmonde, 2005).

The researchers who have developed the theory of pedagogical communications link the micro-practices underlying such communications to how caregivers *play* with their dependents (Gergely, 2007). Indeed, a considerable body of research on these interactions has linked “pretense play” interactions to the development of reflective capacity (Fonagy, 1997; Fonagy et al., 2002; Gergely, 2007; Leslie, 1987; Tessier et al., 2016). In other words, the developmental links between pretense play and reflection bear further investigation. In the next chapter, I turn to these links.

Chapter Three: Literature on Play-and-Reflection

Linking Reflection to Play

In studies of Western caregiving practices, pedagogical communications first appear predominantly during early childhood affect-modulating interactions with primary caregivers (Csibra & Gergely, 2009, 2011; Fonagy et al., 2002; Gergely, 2007; Gergely & Watson, 1996) and subsequently during pretense play with caregivers and peers (Fonagy et al., 2002; Gergely, 2007; Leslie, 1997; Tessier et al., 2016). Furthermore, pretense play stands out for its role in modulating interactive affects while mediating the development of dyadic reflective capacities (Fonagy et al., 1997; Fonagy et al., 2002; Gergely, 2007; Leslie, 1987; Tessier et al., 2016). While caregiving relationships are likely pan-culturally necessary to human development (Panksepp, 2004), their mediations likely vary cross-culturally (Levine & Norman, 2008), meaning that pretense may manifest variably across cultures. Research suggests that through pretense play cultural novitiates learn the actual and potential capacities of the sociocultural semiotic-material mediations of play (e.g., Tomasello & Rakoczy, 2003; Vygotsky, 1966/2016, 2004). The links between pretense play and learning are numerous (e.g., Cohen, 2011; Corsaro, 2003; Fein, 1987; Ferholt, 2007; Fonagy & Target, 1997; Giffin, 1990; Lindqvist, 1996; Sawyer, 1996; Simmons, 2014), and specifically the assembling of play-and-reflection has been repeatedly linked—often as a *necessary* component—to intentional (or institutionally mediated) learning through play (e.g., Otsuka & Jay, 2017; Thiagarajan, 1993; Wouters & van Oostendorp, 2013). Pretense play has often been identified as a key, if not *the* key, interactive context and resource for the development of social competences, theory of mind, mentalization capacities, symbolic representation, and reflective functioning (Csibra & Gergely, 2011; Fonagy et al., 2002; Gergely, 2007; Leslie, 1987; Slade, 1987; Vygotsky, 1966/2016, 2004). Pretense, in

general—whether a function of intentional play such as role-play, or emergent from everyday social interaction (Goffman, 1974)—is a potentially rich interactive landscape for analyzing connections between play, reflection, and learning. For this reason, I first review research on play before returning to a deeper consideration of the connections between play and reflection.

Why Play?

Play has been linked to developmental, physical, cognitive, affective, socioemotional, social interactive, communicative, and educational gains (e.g., Genishi & Haas Dyson, 2009; Miller & Almon, 2009; Youngquist & Pataray-Ching, 2007). All mammals appear to engage play as a biologically mediated affect (Panksepp, 2004). Young humans appear to play everywhere (Huizinga, 1950; Sutton-Smith, 1997; Pellegrini & Smith, 2005). Hope-Southcott (2013) aptly described play as “a complex and layered engagement involving all of the learning domains” (p. 41). Play has been linked to learning gains in memory (Newman, 1990), distancing or decontextualization (Howes & Matheson 1992; O'Reilly & Bornstein 1993), symbolic capacity (Smilansky & Shefatya, 1990), school adjustment (Fantuzzo & McWayne, 2002), social skills (Corsaro, 1988), mathematical readiness (Yawkey, 1981), linguistic/literacy abilities (Davidson 1998; Pellegrini, 1980), cognitive functioning and self-regulation (Krafft & Berk 1998; Saltz, Dixon, & Johnson, 1977), representational competence (Pederson, Rook-Green, & Elder, 1981), and problem-solving skills (Smith & Dutton, 1979). Research into its sociocultural framing has demonstrated how play “leads” development in symbolic formation, self-regulation, imagination, and abstract thought (e.g., Bodrova & Leong, 1996; Elkonin, 2005; Vygotsky, 1966/2016, 2004, 1987). Furthermore, play has been evidenced cross-culturally as a mediator of learning (e.g., Cajete, 2005; Fler, 2004; Fler & Hammer, 2014). This overview is only a small glimpse of the empirical work on the developmental benefits of play.

What is Play?

Broad reviews of play remark on its repetition, exaggeration, fragmentation, and re-sequencing of events, where participants typically approach play intrinsically and voluntarily, flexibly, joyfully, and non-literally as a pursuit in-itself rather than outcome-oriented (e.g., Burghardt, 2011; Smith, 2010). Reviewing philosophies of play, Henricks (2006) determines that play is voluntary and without purpose, extra-ordinary, fun, and yet rule-driven. While older conceptions of play distinguish it from “reality,” contemporary play researchers take up how play is connected to both fantasy *and* reality (e.g., Ferholt, 2007). Play is framed in terms of free expression and rule-adhesion (e.g., Shelton, Satwicz, & Caswell, 2013), drawing together affective and cognitive processes (e.g., Gergely, 2007; Tessier et al., 2016; Vygotsky, 1966/2016). Sutton-Smith (1997) accounts for these varying meanings through play’s inherent *ambiguity*. Gadamer (1960/2004) argues that play activity expresses ontological facticity that cannot be captured through empirical measure. At an evolutionary macro-systemic temporality, Bateson (1972) observes how primate play suggests that play is paradoxical, able to set a frame for interaction whilst being both inside and outside the frame it sets.

Phenomenology of Play: Playful Affect

Play in-itself, or playfulness, is the affect of subjectively feeling playful that underlies free play, physical play, sociodramatic play, role-play, game play, sports play, and so on. In itself, playfulness is the intrinsic condition for play (Barnett, 1990, 1991). Playfulness is valuable, freely engaged, literal, and intrinsically motivating (Rubin, Fein, & Vandenberg, 1983). Trevas and colleagues (2003) identify numerous empirically backed studies itemizing characteristics of playfulness: “imagination, humor, feelings expression, curiosity, novelty-seeking, tolerance and inventiveness (Athey, 1984; Barnett, 1990; Cattell, 1979; Singer and

Rummo, 1973)” (Trevlas, Matsouka, & Zachopoulou, 2003, p. 540). Developmental research suggests that children engage in routine or self-regulatory behaviors more readily when such behaviors are given a playful key or frame (e.g., Manuilenko, 1975; Sullivan & Wilson 2015). Playfulness opens up to other forms of play and emerges continually in all these forms. This includes role-play, in which “[p]layfulness can be associated with the creation of imaginary worlds [...] being open to playing with ideas and new possibilities” (Kangas, 2010, p. 3).

Definitions of interactive play often entail the free volition of the player/actor(s) (e.g., Rubin, Fein, & Vandenberg, 1983), including an endogenous/immanent construction of freedom, pleasure or other similar affect markers (Panksepp, 2004), and a marking of an “as-if” or pretend state that allows players to “be” in frame or negotiate the frame at its “rim” (Goffman, 1974). The hermeneutic arc of the play continuum appears to range from play-in-itself, or play for play’s sake (Gadamer, 1960/2004), to explicit and deliberate attempts to direct play through immersion in playworlds toward particular learning outcomes (Lindqvist, 1996), such as the development of “Quest Atlantis” by design researchers aiming to develop school curricula in video game virtual environments (e.g., Barab, Gresalfi, & Ingram-Goble, 2010). Of focal interest in this study of play-and-reflection is the broad range of play practices referred to as “pretense.”

Pretense play

Several studies have found that young children, aged 2-5, dedicate most of their play talk toward transformations of objects, identities, and situations into imaginaries (Doyle, Connolly & Rivest, 1980; Göncü & Kessel, 1988; Matthews, 1997). Through constructing imaginary scenes, children develop verbal communication, planning, persistence, emotion regulation, and problem-solving (Holzman, 2009; Smidt, 2009). In this manner, they freely and playfully invest their play with *pretense*, varyingly categorized into numerous sub-genres: dramatic, sociodramatic, role-

play, symbolic, fantasy, fantastic, or pretend play. Pretense play appears to be pan-cultural among human children (Smith, 1982), and central to the development of affect regulation (Fonagy et al., 2002; Tessier et al., 2016), mentalization (Leslie, 1987), and reflective functioning (Fonagy et al., 2002; Tessier et al., 2016).

In pretense play, children invest their feelings and emotions into symbolically invented worlds of transformed roles, objects, actions, and themes (e.g., Elkonin, 2005; Lindqvist, 2001; Nicolopoulou, 1993; Piaget, 1936/1952; Vygotsky, 1966/2016). Through pretense, children develop “pivots” that symbolically represent an object, being, or activity different from the expected affordance of the object (Vygotsky, 1966/2016). A broomstick, for example, can serve as a symbolic *pivot* for enacting a horse in a child’s horse-riding fantasy. Children thus learn to link material and semiotic fields—developing symbol-making capacities—through pretense play. Dramatizing—a more complex variant of pretense play—can help “isolate, capture, and simulate increasingly abstract and complex concepts as children’s play unfolds” (Wien, 2008, p. 123). Sociodramatic play—whereby players simulate everyday routines (e.g., making lunch)—makes up about 2/3 of play in preschool children, helping enculturate children to everyday sociocultural practices (Rubin, 1986).

In addition to its touted capacities to develop symbolic and abstract thought (e.g., Tessier et al., 2016), the multimodal embodiment of pretense can also be harnessed to enhance activity involvement, positive affect, and memory formation. Sacha & Russ (2006) found that children taught dance moves with pretend imagery outperformed students who were taught the same imagery without pretend images on learning outcome measures, and that pretend-image learners reported higher levels of joy during the learning. Similarly, Koops (2017) found that children more readily learned new songs when acting out the songs they were learning.

Summarizing a host of studies on the benefits of all variants of pretend play, Gilpin, Brown, and Pierucci (2015) list improvements in language development, narrative competences, emotion-regulation capacities, perspective-taking abilities, and empathic attunement (see also Elias & Berk, 2002; Fantuzzo, Sekino, & Cohen, 2004; Galyer & Evans, 2001; Göncü, Jain, & Tuermer, 2007; Harris, 2000; Hoffman & Russ, 2012; Howes & Matheson, 1992; Lemche et al., 2003; Lindsey & Colwell, 2003; Nicolopoulou, McDowell, & Brockmeyer, 2006; Youngblade & Dunn, 1995). Ashiabi (2007) similarly finds benefits in the sub-genre of role-play across dimensions of socio-emotional, negotiation, problem-solving, perspective-taking, cooperation, social understanding, and theory of mind development. In short, pretense and role-play have been repeatedly and consistently linked to development of reflective capacities—including emotion regulation and understanding, symbolic capacities and abstract thought, and perspective-taking (McArdle, 2001).

The Role of Pretense in the Development of Reflective Functioning

Reflective functioning (RF), or mentalization, appears to be developed through interactive pretense play (Fonagy & Target, 1997; Leslie, 1987), when adults and older youth engage younger peoples through shared play, comforting, joking and explanation of mental states (Dunn, 1996; Fonagy, 1997). For Fonagy and colleagues (Fonagy et al., 2002; Tessier et al., 2016), play is the means through which children learn of the co-existence and distinction of “intramental” and “extramental” realities—the distinction between one’s own mind and the minds of others. RF encapsulates a double capacity, self and relational: one’s capacity to relationally interpret intentions and behaviors of others by inferring their mental states (feelings, thoughts, perceptions, motivations), as well as one’s capacity to anticipate how one’s own feelings and actions will affect or be affected by others (Fonagy et al., 2002). RF also entails

learning that objects can have symbolic representations, which in turn mediate a child's capacity to generate an autobiographical narrative (Fonagy et al., 2002). One's RF capacity underlies one's capacity to adapt to everyday life as well as one's resilience in relation to trauma (Fonagy, Steele, & Steele, 1991).

Playfulness and pretense cultivate RF through the scaffolding provided by playmates (Fonagy & Target, 1997). Playmates are able to generate representations of the world that are *marked* as pretend rather than real. In this manner, dependents are able to learn the functional distinction between affective experiences and the representations that might playfully animate such experiences (Gergely, 2007). By age two, children typically begin to engage in forms of pretend play that intensively and spatiotemporally modify or transform habitual behaviors (see Gergely, 2007, for a summary of the literature; see also Leslie, 1987, for a theoretical discussion).

Gergely (2007) observes that pretend play is marked by the same kind of *contingent* and *ostensive* marking that occurs in pedagogical communications between caregivers and dependents, suggesting that through pretend play children begin to internalize the affect-regulating functions of RF (see also Fonagy et al., 2002; Gergely & Watson, 1996). In effect, Gergely and colleagues have found that the contingent relationality and communicative marking styles of caregivers predicts how well children are able to use play to regulate their affective states. Gergely and colleagues found that contingent "mirroring" by secure caregivers correlated with how often their dependents utilized "spontaneous, creative, and elaborative use of pretense" (Gergely, 2007, p. 74) to regulate affect (Futó, Bátki, Koós, Fonagy, & Gergely, 2004). Additionally, how well caregivers "mark" distinctions between real and pretend mental states correlates with the degree of "pretense competence" exhibited by children, which is to say how

well children understand and manipulate representations generated in play (Gergely, 2007; Futó et al., 2004). In effect, through pretend play, children appear to practice RF by using play-based representations to regulate affect, demonstrating how play is instrumental in helping infants integrate RF as an interactional competency—initially scaffolded by caregivers—that *leads the development* (Vygotsky, 1966/2016) of their internalized reflective capacities. Each internalized representation-affect gestalt is integrated into the unique life-history of each child’s body. As children age and develop more layered discursive capacities, their conversations about feelings and reasons behind people’s actions further develop their RF by generating representations in discourse that are not equivalent to the realities they represent (Dunn & Brown, 1993; Fonagy & Target, 1997; Leslie, 1987). Research on the potential links between secure attachment and RF extends to peer-group interactions characterized by greater reciprocity toward others, increased popularity, and greater levels of empathy (Fonagy & Target, 1997).

The Cognitive Work of Pretense Play

For Leslie (1987), the ability to pretend is a power to make distinctions between “primary” and “secondary,” or “meta,” representations. The content expressed through pretense is contingent on experience, the conceptual-development capacity of the agent, and the knowledge developed and stored thus far by the agent. Using a representationalist model that accords with a linguistic proposition model predicated on reference, truth, and existence relations, Leslie argues that early-life play affords discovery of mental states. Whereby primary representations are comprised of transparent, truthful, existential claims about (physical) objects in the world, meta-representations are representations of representations, *decoupled* from the physical world. Leslie argues that it is precisely this decoupling process that “marks” off *pretense* from *actual* and instantiates *mental state frames*. Mental state frames—indicated

linguistically by such modal verbs as *believe*, *expect*, *want*—are opaque (difficult to link to physical objects), unfalsifiable (difficult to render true or false), and imaginary (nonexistent in a tangible, physical form). Leslie argues that it is not a coincidence that play is characterized by three analogous relations: object substitution (e.g., this broom is a horse), pretend property attribution (e.g., pretending a tea cup has tea in it), and fictive creation (e.g., unicorns). In short, Leslie finds that pretense is a mechanism for developing “mentalization,” or the mental perception of minds, including one’s own and those of others. However, to avoid conflating the representational (comprised of relations between inner world of representations and external world of things represented) and the mental (the symbolic world of relations between representations), interactants must have a way of keeping them distinct. Leslie observes that interactants pretending together must have a way of interactively *marking* meta-representations for *decoupling* so that their opaque, unfalsifiable, and imaginal aspects are foregrounded without creating confusion with representations of the actual world. According to Leslie, such *marking* actions are meta-communications (Bateson, 1972) that signal distinctions between symbolic and representational relations.

Thus, Leslie’s model, which builds on Bateson’s (1972) insights into meta-communication and is a precursor to the framework for analyzing pedagogical communications (Gergely, 2007), provides an inroad to linking play and reflection through their interactive assembling during human development. Pretense is a playfully keyed interactional phenomenon that engages both symbolic and representational processes. At the same time that meta-representations are *marked* and *decoupled* from primary representations, they are also “anchored” in primary representations, keeping them linked. Pivots (Vygotksy, 1966/2016), in particular, appear to be salient interactive objects whose markings likely activate decoupling

processes. *Decoupling* introduces a variability to predications about the world that affords the opaqueness, unfalsifiability, and imagination that characterize pretense and mentalization, while *anchoring* provides the semiotic-material links between meta-representations and representations of reality.

Pretense, Collectivity, and the Development of Culture

Given the evidence that suggests that pretense is social in origin and initiated and facilitated by primary caregivers (e.g., Gergely, 2007; Haight & Miller, 1992; Lillard & Witherington, 2004; Slade, 1987), Rakoczy (2008) provides empirically backed, though speculative, arguments that this implies that pretend play is both predicated on and plays forward a “collective we-intentionality” that is irreducible to single intentionalities, which in turn is a core developmental resource for learning culture (Rakoczy & Tomasello, 2007; Tomasello & Rakoczy, 2003; Tomasello et al., 2005). This learning is multifaceted, for while we-intentionality may be the basal conception of human intentionality, sociocultural mediations of developmental arcs in distinction-making privilege both who/what counts as “agents” and how agency/power is distributed among those agents.

Rakoczy (2008) suggests that socioculturally grounded pretense frames of interaction are communicated through speech acts, akin to the meta-communicative signals conceptualized by Bateson (1972) and in part mapped by Giffin (1990), that distinguish and allocate agency. Games of pretense that develop we-intentionality provide low-stakes environments in which youth learn socially situated norms of interaction for specific communities (Rakoczy, 2008). Indeed, caregiver-dependent pretense play is arguably the “ontogenetically primary instance” of institutionally structured interactive norms (Rakoczy, 2006, 2007, 2008; Rakoczy & Tomasello, 2007). By 18 months, children can participate in games that order social interaction, engaging

sequentially organized participation structures with turn-taking (Brownell & Carriger, 1990; Eckerman & Didow, 1996; Warneken, Chen, & Tomasello, 2006).

In short, research suggests that young children learn the *interaction order* for social interaction predominantly through playful interactions (Rendle-Short, 2014; Riihelä, 2002), including how to detect context-sensitive meanings signaled by meta-communicative contextualization cues (Gumperz, 1992). Children as young as 18 months offer context-sensitive responses to contextualized actions, dispreferring (Schegloff, 2007) such responses to identical actions in the absence of appropriate contextualization cues (Wyman, Rakoczy, & Tomasello, 2009). Rakoczy and colleagues (2006) experimentally demonstrated that children over two could differentiate between intentional states in aborted actual behavior and intentional states in pretend behavior of the same motoric movements, though children under six could not verbalize this understanding. In short, children likely use verbal and nonverbal contextualization cues to signal to others whether interactive behavior is to be interpreted as pretense/playful or as literally intended, and recipient children typically demonstrate responsivity appropriate to this distinction. Taken together, these links between learning, development, collectivity, culture, interaction, pretense, marking, mentalization, and reflection are such a compelling refrain in child development research that they beg for a learning sciences framework to take up these links. However, before I can turn to that challenge, first I must develop theoretical accounts of pedagogical communications and reflective action (RA).

Chapter Four: Theoretical Framework for Reflective Action

Preview

As explored further in this chapter, the theory of RA developed here bears striking resemblances to other theories of social action, namely Jack Sidnell's (2014) "architecture of intersubjectivity" that conditions talk-in-interaction and Chuck Goodwin's (2018) theory of "co-operative action." The connection to Sidnell's theory is unsurprising, given the intellectual heritage linking pedagogical communications to contingency and reference (Csibra & Gergely, 2009, 2011; Gergely, 2007). For Sidnell, the contingency of phatic communion is an issue of primary intersubjectivity that affords the emergence of secondary intersubjectivity, the ostensive grounds for sharing references. So, in a sense, Sidnell's framing adopts the same lineage developed in pedagogical communications, though to explore the intersubjective conditions for turns-in-interaction. One way to interpret this divergence in emphases is that while Sidnell is concerned with everyday interaction, Csibra and Gergely are interested in how the capacities to engage everyday interaction are utilized for pedagogical interactions between caregivers and dependents. Goodwin (2018) seems to appreciate this intent, as he acknowledges the value of analyzing how pedagogical communications develop interactive substrates in directly citing the work of Csibra and Gergely. In his theory of co-operative action, Goodwin outlines how interactants continually transform substrates of their interaction, often through decomposition and reuse of the semiotic actions of prior actions, carrying the past into the present in ways that keep future actions open. Again, the basic structure is nearly identical to the framework underlying pedagogical communications. The key distinction, then, between either an intersubjectivity framework oriented toward phaticity and reference, or a co-operative action framework oriented toward substrate transformations, is that a pedagogical communication

framework is oriented toward *harnessing* the capacities of intersubjectivity and co-operative actions for *pedagogical purposes*. This chapter develops a theory of RA out of the same roots and grounds as the theory of pedagogical communication, with the key distinction again being intent, in this case to reflect for the purpose of onto-epistemic navigation (Bang, 2015; Marin & Bang, 2018) during interaction.

Layers, Frames, and Interaction Analysis

The theory grounding my analysis of RA foregrounds an ontology of human, non-human, and more-than-human interactions, heretofore called *social interactions*. In the onto-epistemology that follows this ontology, social interaction produces perceptions of variation and stasis in human experience and understanding. This onto-epistemology privileges an endogenous account of the situated assembling of layers and frames of material and semiotic mediators of interaction. In such an assembling-of-layers framework, continual variation in the layering of layers—playing forward particular histories inseparable from their own unfolding durations—affords the folding of layers into relatively static and dynamic mediating frames (Thurtle, 2014).

The variation in the layering of layers effects a sense of animation (Thurtle, 2014), or vital substance-durations that over time take on the effect of being agent-like, or acting like an agent (Holland & Leander, 2004; Latour, 2005), including the sense of *collective we-intentionality* (Rakoczy, 2008). These frames derive their relative substantive-durations from their relation to each other, in ratios of stasis and change linked together by a single *differentiator* (cf. Deleuze, 1962/2006) of layering that simultaneously produces both stasis and change (Adkins, 2015; cf. Thurtle, 2014). This differentiator is the interaction itself, carrying forward its own capacity to change itself according to situational contingencies, determining

both the relations of layers and the quality of layers of interaction (cf. Thurtle, 2014). This interactional capacity, so plastic in its adaptivity, is well suited for sociocultural shaping.

Through continual layering upon interactive substrates, I posit here that social action is *webbed* (Noss & Hoyles, 1996) and *assembled* (Deleuze & Guattari, 1987/2004) in *contextual configurations* (Goodwin, 2018) of semiotic-material fields mediating interactions. As a form of socially distributed cognitive action (i.e., assembled and webbed), reflective action (RA) is situated in a historically shaped place and context, mediated by particular activities, bodies, materials and objects both human-made and not, charged with affect, and communicated through semiotic fields reflecting particular cultural-histories that include ordering the distribution of affective powers to act, affect, and be affected. Through the phatic connection (Malinowski, 1918) of the assembling of social interaction—communicated, for example, through frames (Goffman, 1974), chronotopes (Bakhtin, 1981), or contextualization cues (Gumperz, 1992)—particular cultural-histories and distributions of power set in motion particular values and affects that afford or constrain reflective potentials. However, more than just culturally variable, each *situated* and *emplaced* variant of assembled reflection potentially affords different kinds of reflection, and even within the constrained possibilities for a given experience-based reflection, the particular reflective arcs enacted can also vary, depending on which aspects of the webbing/assemblage mediate the reflection (the “medium” of reflection), toward which aspects of the webbing/assemblage the reflection is directed (the interactive substrate and “object” of reflection), and the degree to which RA aligns the intentions/autonomy of the reflective beings (e.g., Davis, 2003).

In this framework, what I call “cultural” or “sociocultural” are complicated constructions mediating and reflecting orientations to situated interaction. My theoretical interest in social

interaction analysis privileges analyzing “culture” as interactively constructed from the interactant perspective (Robles, 2017; Stokoe, 2012). My framing is grounded in situative, sociocultural, and cultural-historical perspectives (Bang, 2015; Bell, Tzou, Bricker, & Baines, 2013; Cole, 2006; Gutiérrez & Rogoff, 2003; Lee, 2002; Nasir & Hand, 2006), which is aptly outlined by Bang (2015):

From a sociocultural perspective, culture, learning, and development are seen as dynamic, contested, and variably distributed and transformed within and across groups and involve a reciprocal and evolving relationship between individuals’ goals, perspectives, values, and their environment. (p. 221)

I posit that interactants construct and play forward cultural-history through habituated and repeated practices of engaging particular patterns of semiotic-material arrangements that afford and constrain potential fields of action over interaction trajectories, including how those trajectories are shaped through endogenous time-space configurations (cf. Gutiérrez & Rogoff, 2003; Nasir & Hand, 2006). My theoretical framing of “power” follows this framing of culture, whereby power is encoded in semiotic fields that dictate how materials are to be ordered, who has power over what materials, and who has power to act in particular ways (cf. Bang, Warren, Rosebery, Medin, 2012; Nasir & Hand, 2006). Furthermore, such powers are reflected in the affective capacities of interactants to act, affect, and be affected—capacities that are ever-fluctuating in relation to the *effects* on going social interactions (Deleuze & Guattari, 1987/2004).

I define what I call “interactants” as bodies with semiotic-material histories that encounter, assemble, and disassemble with other semiotic-material bodies (Deleuze & Guattari, 1987/2004). Cultural ways of being offer interactants options, at times highly compelling, for

how to compose themselves during situated interactions with other interactants. Interactants have several interactive resources (Goodwin, 2018) to draw on as they act within a situated interactive field of possibilities: the structural affordances of interactivity itself (Goffman, 1974; Goodwin, 2018; Schegloff, 2007; Sacks, 1992), cultural-historical practices (e.g., Bang, 2015; Bell et al., 2013; Cole, 2006; Gutiérrez & Rogoff, 2003; Lee, 2002; Nasir & Hand, 2006; Ridgway, 2015), emergent interactant moves and stances (Goodwin, 2018), their own embodied lived-histories (Zahavi, 2003), and so on.

In this theoretical framing, the contextual configurations (Goodwin 2018) of situated interactions position “sociocultural actors” in particular distributions of power that afford and constrain their potentials for action with each other (e.g., Bang et al., 2012; Leander, 2002b; Nasir & Hand, 2006; Wortham, 2004). Given that the power to act is differentially distributed through the layered assembling of social interaction, what is referred to as “agency” is a variable construction-and-enactment expressing how power is played forward and *animates* (Thurtle, 2014) situated interaction. Constructions of “agency” vary culturally in their demarking and situated distribution, including in specifying who is an agent and what an agent can do (Throop, 2010). *Meta-communicative* signaling, or *marking* (Bateson, 1972), during situated interaction conveys implicit information about who is an agent, how agents are related, and how power is distributed among agents in any given situated interaction (Goffman, 1974). Meta-communications, which are also signaled through contextualization cues (Gumperz, 1992), more broadly convey information about the situated interaction in itself, or implicit interactive knowledge, useable toward the immediate interaction, at a minimum. Such information is conveyed through conjunctions of language communications and embodied manipulations of the spatiotemporal intensities affecting interactant sensory modalities mediating the interactions. All

of this information is transmitted through social interactions in which the frames of interaction are continually *configured* (Goodwin, 2013) out of layers of sociocultural history that are re-layered onto each other and ever-changing in their layering in present interaction (Holland & Leander, 2004). Through the combinatoric potential of how layers can combine (Goodwin, 2018), the open-possibilities for unfolding interaction are endless.

I theorize that this process by which layering semiotic fields transforms interactive substrates, which Goodwin (2018) calls “co-operative action,” is also a form of reflective action (RA). Indeed, the key distinction between co-operative and reflective action may be more analytic than ontological, by which the analyst chooses to foreground the reflective aspects of co-operative actions to analyze how co-operative actions get used in particular ways, specifically reflective in this case. I posit that through RA, cultural novitiates web and learn sociocultural mediations of meta-communication localizable to situated interactions (i.e., “framing”) while “accumulating” (Goodwin, 2018) enduring sociocultural semiotic-material mediations. Through sociocultural-human development, novitiates learn about situational variability and the dual existential necessities of layering-and-framing, on one hand, and sociocultural resources mediating the layering of frames (i.e., constructing, affirming, contesting, and deconstructing), on the other. Given that RA likely varies in each assembling of social interaction, with numerous interactional factors producing this variation, the substantive-durations comprising *culture* likely become organized differentially across sensory modalities along spatial, temporal, and intensive dimensions (cf. Cole, 2006; Csibra & Gergely, 2011; Gergely, 2007; Lemke, 2000). Indeed, evidence supporting this thesis of cross-cultural variation of RA appears to be surfacing (cf. Little et al., 2016).

Preliminary research on the communicative structure underlying pedagogical communications—the same structure that I posit underlying RA—suggests that it has common components in all its instantiations. Such a thesis accords with Cole’s (2006) proposals that certain biological potentials pervade human activity that in turn take on contextualized meaning in the creation of local cultural practices. Biological commonalities include interaction, spatiotemporal enactment, sense modality mediation, contingency, phaticity, ostension, and referentiality; variability, however, is found *within* each of these necessities, as well as how they are interactively laminated. For example, RA may be predominantly mediated by sight, sound, or touch depending on contextual factors, and what kinds of referencing gets privileged can be highly variable cross-culturally, cross-geographically, and cross-situationally.

The Theory of Pedagogical Communication

Regardless of whether or not harnessing the inherent qualities of shared understanding—or intersubjectivity—is learned or inborn, human beings everywhere seem to be confronted with meta-communicative necessities of interaction irrespective of its cultural variation or manifestation. While these necessities emerge variably wearing the cloth of cultures, their facticity exists the same for all culturally-mediated experiences. Research on Western caregiver-infant interactions suggests that in navigating the onto-epistemology of social interaction, caregiver-infant dyads become pedagogue-learner dyads by harnessing the meta-communications of layered assembling of social interaction in order to develop and transmit *cultural knowledge* through specific micro-practices of “pedagogical communication” (Csibra & Gergely, 2009, 2011; Gergely, 2007). Specifically, through meta-communicative “marking” practices of contingency and ostension, pedagogues harness the interactive capacity for change (Thurtle, 2014) by opening up “as-if” interactive spaces marked as pretense (Leslie, 1987), imaginative

(Vygotsky, 2004), mental (Leslie, 1987), referential (Csibra & Gergely, 2009, 2011), and so on (see Bateson, 1972). The developmental capacity to mentalize “as-if” frames and layer these onto “actual” frames underlies the capacity to layer semiotic fields onto interactive substrates (Goodwin, 2018), transforming their onto-epistemic meaning to interactants. I posit (1) that pedagogical communications exemplify early developmental social mediations of RA and (2) reflective discourse (RD) is a practice that sustains pedagogical communication. To explore these claims further, I will first look more closely at the structure of pedagogical communications.

Contingent Responsivity and Phatic Connection

The theory of pedagogical communication entails three kinds of communication: phatic, ostensive, and referential. Phatic communications establish primary intersubjectivity in social interactions (Sidnell, 2014), including the mutually *contingent* responsivity of an interaction (Csibra & Gergely, 2009, 2011; Gergely, 2007; Gergely & Watson, 1996, 1999). Gergely and Watson (1999) argue that *mental* capacities such as imitation, reflection, and theory of mind presuppose a more fundamental *interactive* capacity to detect contingent responsivity, evidenced empirically in the finding that “human infants are sensitive to the existence of *contingencies between their behavior and environmental events*” (p. 101, emphasis in original). Infants in Western studies show a predilection for interacting with agents engaged in contingent behaviors, such as affect mirroring (Gergely & Watson, 1996), that signal to the infant the availability of an interactive partner for turn-taking interactions (Floccia, Christophe, & Bertoncini, 1997), sustained eye contact (Farroni, Csibra, Simion, & Johnson, 2002), and tonal cadences of motherese (Cooper & Aslin, 1990). Contingent behaviors appear to induce participation in the ordering of social interaction (Gergely & Watson, 1996). These interactive contingencies are

perceived through the senses and have variable temporal, spatial, and intensive dimensions (Gergely, 2007; Gergely & Watson, 1996, 1999). The effect of ongoing and contingent interactivity is the building up of phatic communion (Malinowski, 1918), or phatic connection.

Ostensive Marking

Ostensive marking works simultaneously on interactive and mental layers. Within a phatic connection, interactants use ostensive marks to signal that a new frame or layer will be added to the phatic connection that is referential, inferential, and informational (Csibra & Gergely, 2011; Gergely, 2007). Thus, ostensive markings *meta-communicate* (Bateson, 1972) that multiple interactional “frames” for understanding the interaction are in play—including a frame or perspective other than the most readily available frame. Such markings open up as-if/pretense referential layers to an interaction and designate the participation structure of interactants in those layers (Csibra & Gergely, 2009). Ostensive markings *decouple* (Gergely & Watson, 1999) inferential information from the phaticity of the interaction, making it available for referencing, while also signaling their continued linking. Such marking also acts on *mental* layers by *decoupling* mental/pretense states from pre-reflective, lived, and literal experience, making it possible for interactants to reflect on and mentalize their own and other perspectives (Leslie, 1987; Gergely & Watson, 1996, 1999).

The dual interactive and mental functions of *marking* are not coincidental or orthogonal, but appear to be developmentally linked (Fonagy et al., 2002; Gergely & Watson, 1999; Gergely, 2007; Tessier et al., 2016). Generally speaking, *marking* appears to afford mental processing of at least two perspectives that are separate yet connected through the emergence of each one out of its relation to the other(s)—e.g., individual/interactive; pre-predicative/ predicative; actual/pretense; pre-reflective/ reflective; phatic/inferential; ostensive/referential; etc.

In caregiver-dependent pedagogical interactions, ostensive markings are typically signaled through unexpected or non-projectable inflections of the spatiotemporal sensory intensity of the interaction (Gergely, 2007). This is often accomplished in early development by manipulating time, space, and sensory intensity through pretense interactions. Such interactions begin with pretense framing cues (i.e., contextualization cues meta-communicating a “pretense” frame) such as eyebrow raises and include (a) “*exaggerated, slowed down execution,*” (b) “*schematic, sometimes abbreviated or only partial execution of otherwise normalized behavior patterns,*” and (c) the mixing of mirroring with non-mirroring actions (Gergely, 2007, p. 61, emphasis in original). In teacher-student pedagogical interactions, ostensive cues may include direct gaze at the addressee, eyebrow raises, and vocalizing (“vocalese”) or motioning (“motionese”) in a pretense manner for a particular relationship (cf. Burgoon, Guerrero, & Manusov, 2011).

Cross-cultural Variability in Contingent and Ostensive Marking

Researchers argue that pedagogical communications harnessing contingent and ostensive marking are inherent to Western culture caregiver-dependent interactions (Csibra & Gergely, 2011). Research comparing Western and Indigenous pedagogical interactions has found that while the communicative structure of pedagogical interactions *may be* pan-cultural, including contingent and ostensive marking, the modal mediations of contingency and ostension likely fluctuate culturally (Little et al., 2016). For example, interactive contingency appears in Indigenous cultures, as well, but with modal proclivities that privilege sound (Scollen, 2012) or touch (Little et al., 2016) rather than sight. Furthermore, contingency may be variably structured into culturally-mediated frames of interaction to begin with, meaning that whereas Western interactants may need to more ostensibly mark contingency, some Indigenous cultures may

already practice contingent relationality as an axiological orientation to shared existence and thus do not need to mark such contingency so openly (e.g., Cajete, 1994).

Ostensive-Referential Communications

While ostensive cuing is the aspect of pedagogy that orients the addressee's attention to a forthcoming communication, the forthcoming communication itself is referential and informative, orienting the addressee's attention to novel referent-reference relationships (Csibra & Gergely, 2011). Csibra and Gergely (2009) emphasize that while referential aspects of pedagogical communications can be symbolic, iconic, or indexical, the indexical feature, which orients interlocutors to the contextual factors such as the physical environment of the communicative space, constitutes the earliest kinds of pedagogical references in development. Specifically, they argue that deictic gestures, such as gaze-shift and pointing, which draw indexical attention to environmental objects, likely constitute the general forms that ostensive-referential communications take on throughout human development.

Accounting for cross-cultural variation in pedagogical communications (e.g., Little et al., 2016), it is possible that a general model of sensory-arousal (gaze or other senses) coupled with deictic orienting (e.g., pointing) is pan-culturally valid for how pedagogical communications are mediated. Csibra and Gergely (2006) contend that pedagogical communications must direct the learner's attention to what is relevant and novel in the learning context, which is to say that they "constrain and channel [the learner's] inferences towards the appropriate interpretation" (p. 7). This indeed may be the process by which cross-cultural variations are taught to cultural novitiates. Thus, while referentiality is developed in Western child-rearing by directing infant eye gaze through deictic gestures such as pointing that indicate particular objects (Gliga & Csibra, 2009), the mediation of referentiality likely varies cross-culturally, meaning touch or

sound, for example, might be augmented more than sight, leading to different kinds of references (Little et al., 2016).

RD, Pedagogy, and Learning

Pedagogical harnessing of the actions of communication has direct implications for theories of learning and pedagogy. Csibra and Gergely (2009) argue that communication in general “allows mutual adjustment of actions towards common goals, sharing information that is necessary to build common plans and to confirm and verify commitments to collaborative efforts” (p. 1154). While their empirical work focuses on caregiver-infant learning dyads, given its consonance with Relevance Theory of communication (Sperber & Wilson, 1986; Žegarac & Clark, 1999), conversation analysis (Schegloff, 1968), and linguistic anthropology (Duranti, 2009b), it seems plausible that such a communicative process *could* endure across human lifespans through nonverbal communications, perhaps in conjunction with verbal communication, potentially underlying pedagogical interactions at all ages. A testable (and refutable) implication of this model of pedagogical communication is that such communications should be present in any given learning environment, between interactants of any age, and present in any given cultural community.

As discussed in chapter two, in the Cobbian model (Cobb et al., 1997) of reflective discourse (RD), a “shift” transforms the first phase (akin to primary intersubjectivity) of an interaction into an object for reflection in the second phase (akin to secondary intersubjectivity). In a more general anthropological and phenomenological analysis, Duranti (2009a) calls the transformation of pre-reflective (primary) experience into reflective (secondary) experience a “modification.” As a harnessed practice of sustained pedagogical communication, a phenomenological model of RD *potentially* yields a pan-cultural interactional-biological model

of how cultural onto-epistemologies are taught, at all ages. For example, educators may slow and inflect their speech when explaining new concepts and speakers may use facial expressions such as eyebrow raises to signal salient information to interlocutors. Indigenous educators may pause before a tree and help learners attune multiple senses to the communications emitted by the tree. Such signaling indicates to the recipient that the speaker is sharing information known to the speaker but not the receiver. Adept educators may find that they employ an array of contingent and ostensive marking actions to teach different students. In any event, as a set of micro-practices harnessing the inherent properties of social interactions for pedagogical communications, RD constitutes a compelling unit of analysis for more systematic study. However, for the sake of theoretic and analytic clarity, in the next section I formalize a theory of reflective action (RA), clarifying how pedagogical communications and reflective discourses are special cases of RA.

A Theory of Reflective Action

From a theoretical standpoint, I have developed three constructs related to RA around which to design my analytic framework for analyzing the data I have collected.

Table 1

Typology of RA

Reflective Action (RA)	transformative actions directed toward substrates, or reflective objects, ranging from autonomic expression to intentional transformation
Pedagogical Communication	RA harnessed for pedagogical purposes through contingent-ostensive-referential communications
Reflective Discourse (RD)	intentional RA interactively “stepping back” to discursively “dwell” with objects of reflection

The theory of pedagogical communication is modeled after Relevance Theory of Communication (Csibra & Gergely, 2009; Sperber & Wilson, 1986, Žegarac and Clark, 1999) in which the inferential affordances of communication are harnessed for pedagogical purposes. I map these same inferential affordances to what I call the autonomic (phatic) and intentional (ostensive-referential) arcs of RA. In other words, I theorize that communication *is* reflective, which I elaborate further below. From this position, it follows that pedagogical communication is actually a particular form of RA; specifically, it is RA that, through turn-design (Schegloff, 2007) during co-operative action (Goodwin, 2018), is given a pedagogical purpose. Thus, analyzing how interactants “mark” contingency and ostension during pedagogical communications can be used to map how interactants enact RA.

Autonomic-Intentional Continuum of RA

Autonomic reflection. The autonomic theory of action (including communication and discourse) holds that action is inherently, or autonomically, reflective, because all action reflects its ongoing historical constitution. Autonomic reflection reflects its historicized and immanent environment but does not *reflect on* that environment (including utterances of the environment). For example, a window reflecting city lights is the window’s autonomic (transitive) reflection of light. Even the sun producing all the light of the solar system reflects that the sun has the capacity to produce such light.

Every speech action is autonomic in that speech transitively reflects particular relations between embodied states (of beings that utter things) and meanings of speech utterances, without necessarily reflecting upon these relations. In discourse in educational contexts, autonomic-reflective discourse is akin to identifying by naming something, providing memory-based knowledge, and answering who, what is, when, and where questions. In discourse in general,

speech acts such as “hand me a towel” reflect the speaker’s need, though the speaker does not appear to reflect or invite reflection on this speech order. Declarative sentences often take on predominantly (but not exclusively) autonomic meaning: “the sky is bright orange” offers referential meaning linking sky to color but does not necessarily invite further reflection on why the sky is bright orange or why the speaker thinks the sky is bright orange (however, for cultural variation, see notes below on intentional reflection). However, these examples also show how autonomic-reflections produce pre-reflective objects with the potential to be taken up as objects of reflection in intentional RA. For example, asking *why* the sky is bright orange makes a deliberately reflective turn toward the initial relatively autonomic utterance.

Intentional reflection. Given that all action reflects its history, action that is deliberate about this history marks it and carries it forward for more intentional reflection. Utterances deliberately oriented toward reflecting on the relations of utterance to meaning and/or speaker are intentionally reflective. Intentional reflection “steps out” (Ackerman, 1996) and dwells in autonomic reflections. Such movements are interactively marked through multi-modal ostensive markings—such as through interrogatives coupled with interactive pauses (Salmon, 2016), vocalic and embodied modulations (Gergely, 2007), environmentally coupled gestures (Goodwin, 2018), or metapragmatic markers (Leslie, 1987)—to reflect on how, why, or what’s happening.

Non-discursively, a child wanting to play with a rope autonomically reflects a non-conscious motive to play while a child thinking about why they chose the rope engages conscious, intentional reflection. In discourse, asking “Why is the sky bright orange?” and “Why do you want me to hand you a towel?” draw explicit attention to the meaning states in the utterances and how they are linked to environmental actants or phenomena^a. Intentional

reflections can be interrogatives but are not necessarily so. Ultimately cultural-historical practices and interactive contingencies determine how interactants interpret the extent of reflection an action is performing. For example, saying “look at how the sky is orange” may do more than declare that the sky is orange; in some cultural practices, the attentional directive to “look at” may mark an invitation to intentional reflection (Marin & Bang, 2018). Furthermore, in some cultural practices, intentional reflection is invited whenever observations are made at all, and thus the standalone utterance, “the sky is orange,” would be construed as invitation to reflect on that utterance.

Distinction between autonomic and intentional. The distinction between autonomic and intentional is not a mutually exclusive binary (i.e., categorical), but one of elaboration and addition. Intentional reflections always imply autonomic reflections, which is to say that intentional reflection is always lodged in a world already present, not standing outside that world, and thus reflecting on it immanently. The intentional further elaborates on the autonomic, adding a layer to autonomic that nonetheless *depends upon and carries forward* the autonomic. For example, the observation “Jake was tired” autonomically reflects that Jake was tired (i.e., the statement transitively reflects a state in the world (Jake’s tiredness) but does not necessarily reflect on this state). However, “Jake reflected on why he was tired” invokes the intransitive construction of reflect (“reflected on”) and explicitly entails reflecting on the autonomic state.ⁱⁱⁱ

With each of these major conceptions of RA developed, I am now positioned to develop a theoretical framework for investigating the interactive assembling of play-and-reflection.

Theoretical Framework for Conceptualizing Play-and-Reflection

Play and reflection appear to be inseparable aspects of human development and experience. Both appear to share linked origins in human development (Fonagy et al., 2002;

Gergely, 2007; Leslie, 1987; Tessier et al., 2016) and phenomenological experience (Zaner, 2010). Both harness interactive markings to make distinctions between two different scales of reality. And both are noted for how they mobilize and enhance agentic capacities. Indeed, self-direction, or player volition, is a necessary condition to play in many of its definitions (e.g., Cohen, 2011; Garris et al., 2002; Huizinga, 1950; Otsuka & Jay, 2017; Sutton-Smith, 1997; Thompson et al., 2010; van Dijk et al., 2015; Wilson et al., 2008), and, phenomenologically, the greater the reflective mediation of immediate, pre-reflective experience, the greater an agent's sense of agency (Throop, 2010). Thus, whatever the relation of play and reflection, a distribution of agency appears at work in both. How agency is conceptualized, ranging from an autonomous capacity of a conscious individual being (Zahavi, 2003) to a social distribution of situated power (Deleuze & Guattari, 1987/2004), greatly affects how play-and-reflection is framed, modeled, and appears (Throop, 2002). For example, a theme extending across much of the research on play and reflection does bind reflection to play in a particular ordering: wherever the two co-occur, play appears to precede and afford reflection.⁴

Play-and-reflection appear to be interactively *webbed* (Noss & Hoyles, 1996) and *assembled* through value-driven (i.e., *axiological*) distributions of power, meaning, and material (i.e., “agencement”), situated in space and time, extending into the nebulous horizons of activities comprised of materials, bodies, and semiotic fields that make and/or break down “territorial” (i.e., semiotic-material) distinctions in the webbed assembling (see Deleuze & Guattari, 1987/2004; Bennett, 2009). Any given assembling of play-and-reflection entails laminating particular contextual configurations (Goodwin, 2013) of material and semiotic fields through reflective actions (RAs) that are conditioned by cultural-histories, explicit and implicit articulations and distributions of power, geography, interactive resources, individual capacities,

and so on. Each variant of assembled play affords different reflective potentials, and even within the constrained possibilities for a given play-based reflection, the particular reflective arcs enacted can also vary, depending on which aspects of the interactive assembling mediate reflection (the “medium” of reflection), toward which aspects of the webbing reflection is directed (the “substrate” or “object” of reflection), and the degree to which collective RA aligns with the intentions/autonomy of the reflective beings (e.g., Davis, 2003). From this situative and interactive perspective of play-and-reflection, I posit that RA mediates “epistemic action” (Goodwin, 2013) that *emerges* from the affordances of any given assembling of play-and-reflection.

Prior research on the interactive assembling of play-and-reflection suggests that such webbing entails contingently responsive timing (e.g., Gergely, 2007), phatic connection, alignment of collective intentionality (e.g., Otsuka & Jay, 2017; Rakoczy, 2008; Salmon, 2016), spatiotemporal intensive disjunctions (e.g., Gergely, 2007) including reflective “pauses” (Salmon, 2016) and discursive “shifts” (Cobb et al., 1997), and “functional dependencies” (Otsuka & Jay, 2017) articulating context-specific semiotic-material conjunctions (e.g., Otsuka & Jay, 2017; Vygotsky, 1966/2016, 2004). The phenomenon of “marking” appears particularly central in linking reflection to play, whereby marking helps interactants index culture (Ochs, 1990; Robles, 2017), signal contingency and build phaticity in the construction of we-intentionality (Rakoczy, 2008), and decouple pretend/mental from actual intentions in the reflective communication of referential information (Leslie, 1987). In playful pretense, “marked” objects “pivot” between literal and figurative meanings, “anchoring” opaque, unfalsifiable, and imaginative meta-representations to representations of actual phenomena (Leslie, 1987). In play-based pedagogies harnessing pretense-play, play-and-reflection affords expansive learning

through reciprocal and progressive relations among interactants in open-ended cycles of play-and-reflection (Salmon, 2016).

From a pedagogical design standpoint, various research suggests that when play and reflection are cultivated through *contingent* social relations (Gergely, 2007), conjoined with open-ended materials and prompts, learner agency is heightened (e.g., Davis, 2003; McLoyd, Warren, & Thomas, 1984; Mirzeoğlu, 2014; Møller, 2015; Salmon, 2016). In the *phatic* yoking of agencement, *playful affect*—broadly defined as goal-less activity (e.g., Gadamer, 1960/2004; Kohn, 1992)—helps *key* (Goffman, 1974) the intersubjective alignment (Schegloff, 1992; Sidnell, 2014) of collective intentionality (Rakoczy, 2008) that is necessary for pedagogues and learners to achieve the requisite mental alignment to engage in learning together during play-and-reflection. Through such alignment, learning likely emerges as a “naturalized” member’s phenomenon (Stevens, 2010). For example, in finding that open-ended prompts to reflect were more efficacious than content-specific prompts, Davis (2003) speculated that the open prompts made it easier for students to enter their zone of proximal development (ZPD) because such prompts afforded greater alignment with learner autonomy. Just as generic prompting to reflect may help a student open up onto their ZPD (Davis, 2003), play also affords a ZPD unto the player itself, with or without the presence of other humans (Vygotsky, 1966/2016). In the cases of both play and reflection, an individual’s ZPD is activated through agentic distributions that increase that individual’s power to affect and be affected.

Framing Play-and-Reflection for Interaction Analysis

The framing of play for the study of play-and-reflection can prove difficult. VanderVen (2004) outlines several dichotomies used by researchers to frame play: fantasy-reality; work-play; process-product; pleasurable-serious; rule based–free flowing; choice-requirement;

freedom-constraint, and past-future (see Marks-Tarlow, 2010). Such dichotomizations may reflect researcher etic-orientations rather than player emic-perspectives on play and they provide ample reason to be cautious about reifying a play-reflection dichotomy. For example, whereas some prominent play researchers have operated with a fantasy-reality dichotomy in framing play (e.g., Piaget, 1962), Marks-Tarlow (2010) notes that several play researchers have problematized this distinction (Fromberg, 2002; Singer & Singer, 2013; Winnicott, 1971; VanderVen, 2004), drawing on a metaphysics of conjoined semiotic-material reality to demonstrate that fantasy is part of reality and contains potential transformations of such reality. In the next chapter, I weigh out how to frame the study of play-and-reflection through an IA lens in the learning sciences.

Jerolmack's (2009) proposals for non-anthropomorphic interaction analysis (IA) provides a basal framework for thinking about the relations between play and reflection. Shifting away from a researcher (etic) oriented framing of play, Jerolmack outlays six considerations in interactively analyzing the affordance potentials of play: (1) mental capacity of actors; (2) personal sociocultural histories of the actors; (3) relationship of the actors; (4) space between the actors; (5) the place in which interaction takes place; (6) time allotted for play episodes. Such considerations account for the intersubjective capacity of playful interactions as well as the complexity and capacity for novelty of the play. Jerolmack speculates that the capacity for intersubjectivity and play sophistication are directly correlated, mediated by playful interactions. Furthermore, greater degrees of intersubjectivity may afford greater equality among players during play. Analytically, Jerolmack's first three considerations can be partially addressed through ethnography, while the latter three are visible to IA. Furthermore, the first three may be inferable from what is observable to IA. In short, Jerolmack's framework for linking play and reflection is interactively analyzable, specifically through how interactants "mark" their

interactions with contingency and ostension (Csibra & Gergely, 2009), pretense and actual frames (Bateson, 1972; Leslie, 1987), and cultural indexing (Ochs, 1990; Robles, 2017). To further frame how to analyze social interactions for the work accomplished by play-and-reflection, I now turn to my methodological framework for doing so.

Chapter Five: Methods

Given the compelling implications that might follow from interaction analyses of how interactants enact reflective action (RA) through pedagogical communications and reflective discourses (RDs), I have designed my analytic framework around elucidating RA as my unit of analysis. Drawing on data sets from two iterations of a community-focused design-research study (Brown, 1992; Bang, Faber, Gurneau, Marin, & Soto, 2016), I use several analytic toolkits to conduct ethnographic and interaction analysis (IA) of audio and video recordings from two design iterations (Design-Based Research Collective, 2003) of Indigenous Science Technology Engineering Art and Math (I-STEAM) Live Action Role-Play (LARP) to identify endogenous, interactive assemblies of reflective action (RA), reflective discourse (RD), and play-and-reflection. Data analysis included ethnographic journaling of 30 hours of video and audio recordings (Goodwin, 2009; Kissman, 2009; Schindler, 2009) and IA (Jordan & Henderson, 1995) of 7 hotspot episodes (Schegloff, 1987a). Adopting RA as my *unit of analysis*, I developed five codes to map RA across transcriptions of strips, chunks (Van Es & Sherin, 2002), episodes (Schegloff, 1987a), and designed activities (Barab, 2006) of interaction during I-STEAM LARP. In this chapter, first I will introduce the source of the data, then I will discuss axiological considerations in doing learning sciences research, and then I will review the analytic methods I employed to analyze the data.

Table 2

Data Overview

	I-STEAM LARP
Participants	Indigenous Youth, facilitators, designers, data collectors
Place	City Parks & Indigenous Lands

Goal	Development of land-based, Indigenous relational onto-epistemologies, axiologies, and plant eco-perspectives
Data collected	Two years of LARP scaffolding and enactment

Data-set: I-STEAM LARP

Context

An overview of the data collected is provided in Table 2. The I-STEAM LARP data is drawn from a larger, NSF-funded participatory design research (PDR; Bang et al., 2016) study in and across Indigenous and Western knowledge systems with Indigenous youth. The ethos of the study design aligns with Indigenous onto-epistemologies and axiologies that practice principles of respect, reciprocity, responsibility, roles, relations, and gifts. Key constructs of the broader camp include inclusive views of humans and nature, mediating environmental learning through outdoor and land-based education, development of relational onto-epistemologies (see Bang et al., 2012). Heterogenous ways of knowing were promoted through practices of “storytelling” (Marin & Bang, 2015; Ochs, Taylor, Rudolph, & Smith, 1992) and “reading” land (Marin & Bang, 2018). Privileging Indigenous epistemological orientations toward flora, plants were foregrounded in the camp as relatives of humans, bearing keystone roles in sustainable ecosystems. Propagating across the practice and analysis of I-STEAM, this emphasis in framing of science education is in itself a positive and affirmative foundation for practice and analysis. Secondly, it functions as a political response to normative Western frames about plants being unrelated, at a distance, objects for manipulation, and other similar frames antithetical to a plant-as-relative frame. This ordering matters here, for the value of plant-as-relative is not simply a

negative reaction to Western norms, but an axiological position first and foremost in its own right.

Simulating an ecosystem of the camp's setting in the Pacific Northwest during Live Action Role Play (LARP) was one component of the camp for two design cycles. As part of LARP development, youth rehearsed 'becoming-X,' whereby X was a "keystone" plant relative in the camp's semiotic and material ecosystems (see de los Angeles, 2016). On the final day of camp players enacted a LARP Finale, simulating their ecosystem over many seasons and years. Drawing on Indigenous storytelling practices (Marin & Bang, 2015), the finales included plants, animals, seasons, weather conditions, Changer, tricksters, and other fictional creations of the youth as key *actants* (Latour, 2005)—meaning that humans, non-humans, and the more-than-human were all acknowledged as legitimate agents in the playworld (Lindqvist, 1996). The finales were designed to mediate how participants used their bodies, discourses, and environmental affordances to assemble their relations into role-play of their actual Pacific Northwest ecosystem. LARP was conducted for two of five design iterations of the I-STEAM camp, which is still ongoing.

Sites

The I-STEAM LARP data was collected over two years across multiple locations on historical and present-day Pacific Northwest Indigenous lands—amongst ponds, forests, and creeks. In 1970, 20 acres of these lands were taken over by a peaceful occupation of Indigenous peoples, and an inter-tribal foundation was formed to take over stewardship of the land, reclaiming it for urban Indigenous peoples with deep ancestral ties to the land.

Any study conducted on historically First Nations' lands in North America with Indigenous peoples needs to explicitly account for this cultural-historical context. This context is

embodied in the lands in this study (Tuck, McKenzie, & McCoy, 2016). The semiotic landscapes emerging between the families attending the I-STEAM camp and the lands of the camp organize complex *configurations* (Goodwin, 2013) for educators and learners— Indigenous and non-Indigenous—during their shared learning experiences on the lands. Indigenous peoples in what are now called the Americas have a long and culturally rich history that pre-dates the arrival of colonizers from Europe. These histories are still alive and present, shared through stories, art, rituals, and artifacts as well as through relations to land, water, air, and so on (Cajete, 1994, 2000; Deloria, 1997). They have also been layered by Colonial violence—conquest, subjugation, and erasure of Indigenous heritage (Wolfe, 2006). And they continue to be layered on by Indigenous resurgence (Simpson, 2011) and collective continuance (Whyte, 2017), opening multiple possible futures for onto-epistemic navigation and sociopolitical action of Indigenous peoples as part of the lands (Bang et al., 2015; Simpson, 2014; Tuck, McKenzie, & McCoy, 2016). The site of the present study is especially important in this regard, as it is an indicator of Indigenous resilience and resistance, the assertion that Indigenous peoples retain their rich history, and that they continue to persist and even thrive in contemporary, urban communities.

Participant Selection

The two years of I-STEAM camp were comprised of 30-40 Indigenous youth, affiliated with over 20 tribes, aged 5-18. Most participant families were returnees from prior years at camp. Design team members also recruited families through other research projects, as well as through broader outreach efforts to recruit through social networks of Indigenous peoples in the region. Participation also included the design team, comprised of Indigenous peoples from a local university and the broader local communities, environmental scholars and other Indigenous

and non-Indigenous scholars with relevant knowledge practices, and non-Indigenous university researchers dedicated to the ethos of the design team.

Researcher Positionality

I am an ostensibly adult, white, male, Western-educated, university-affiliated researcher of learning. The positionalities afforded by these identifiers likely shaped what was made visible to me by others, and what was hidden. Furthermore, my own cultural-history affords nuanced perception toward those sharing parts of my history while constraining my perception of those coming from different cultural-histories. Professionally, I have spent over 10,000 hours tutoring students (typically but not exclusively one-to-one) and over 10,000 hours reflecting on and studying learning processes (i.e., 7 years of grad school plus 10 years of writing “tutoring reports” for nearly every tutoring session I led).

For I-STEAM LARP, I assisted in data collection, filming some of the analyzed data, and some of that data includes me as a participant. At times, I was positioned as someone who was knowledgeable about the objectives of the learning environment or the research setting, though I will attest that I was (and still am) relatively naïve about both Indigenous Ways of Knowing and Western Science practices, including their intersections (Medin & Bang, 2014), and my participation in camps beyond data collection of LARP was motivated primarily by circumstance and youth insistence.

In I-STEAM LARP research, I co-managed how data was collected as learning environments were enacted. Due to stark cultural-historical differences in my aforementioned identifiers and those of Indigenous participants in the study, my positionality was probably especially pronounced in the eyes of the Indigenous youth. As a person holding the camera, I was afforded considerable prestige and attention (Frers, 2009), even if I was not generally

participant to the LARP activities. However, evidence supports the interpretation that the youth often treated me as a kind of peer, or at least as an equal. For example, at the end of the third year of the camp, an Ojibwe elder who was a guest, designer, nurse, educator, doctor of Women's Studies, elder, and medicine woman remarked (during a recorded daily debrief) that in my everyday interactions with the youth at the camp I embodied Indigenous pedagogies, which in part emphasize equal footing of teachers and learners (Cajete, 1994).

LARP Data Collection

The I-STEAM camps took place once a year over one week, with daily play activities enacting various relatives and actants in ecological systems. I was tasked with overseeing data collection, including coordinating with designers which interactions to record and deploying recording equipment before and during activities. Recordings consisted of handheld cameras and audio recorders, as well as POV cameras. Ideally, this afforded data collection from multiple perspectives of the play and related activities. Artifacts from the field were collected, including facilitator fieldnotes and pre-fabricated mediators such as LARP instruction guides. At the end of the camp, students generated artifacts (e.g., drawings of ecologies). Data analyzed for this study were drawn from about 30 hours of video and audio recordings covering about 6.5 real-time hours of LARP scaffolding exercises and finales over two years. Certain activities were divided into several, separate sub-groups running simultaneously, and several had multiple recording devices on the same activity.

Axiological Considerations

Ethics

Here I set out my ethic in engaging my work by clarifying who I am, my vested interests, for whom my work is intended, and toward what ends. I have practiced as a one-to-one tutor for

twenty years, working with tutees aged 4-37, from various socioeconomic, cultural, and ethnic backgrounds, though predominantly those from white, affluent, mainstream America. The purpose of this research is to contribute to an ethic of *care* (Noddings, 2013) in educational research and pedagogical practices that affords optimal learning by highlighting caring pedagogical practices that are contingently responsive to the situational emergence of learning, geographically attuned to lands and waters enlacing learning, and culturally sensitive to power dynamics and participant historicity shaping learning potentials. Early in my post-doc, I would like to expand analysis to broader data sets collected during I-STEAM (which is still ongoing as part of an NSF grant) and develop collaborative papers for publication further exploring the learning affordances of the interactive assembling of RA (such as expanding perspective-taking capacities). My findings are intended for learning science theorists interested in how learning environments endogenously mediate their own learning experiences through reflective and/or playful processes, for educational practitioners in all formal and informal pedagogical interactions, and design-based teams working on I-STEAM.

Ethnomethodological Concerns

I adopt an ethnomethodological approach to analyzing the data, analyzing learning as a member's phenomenon that is constructed interactively from their perspective (Stevens, 2010). For this reason, I have adopted toolkits broadly referred to as interaction analysis (IA; Jordan & Henderson, 1995) to analyze the data, which are grounded in longstanding traditions of analyzing only those elements of contexts that can be demonstrated as relevant to interactants (Schegloff, 2007). Recognizing that IA is always a theoretically guided selective process (Duranti, 2006; Hall, 2000; Ochs, 1979), I recognize that prior theories on play-and-reflection, pedagogical communication, and RD guide what I orient to and privilege in the data. Conducting

IA helps to affirm or trouble this privileging, and where troubled I returned to the data for further analysis using additional IA toolkits as well as external perspectives from relevant experts.

Given my concern for an ethnomethodological orientation, I am especially concerned with how theoretical constructs I employ are constructed from the perspectives of interactants themselves (Schegloff, 2007). Methodologically, I posit that interactant perspectives are only adducible through analyzing interactive resources such as indexical “markedness” (Ochs, 1990; Robles, 2017), membership categorization devices (Stokoe, 2012), and next turn proof procedures (Sacks, Schegloff, & Jefferson, 1974) that affirm endogenous meanings ratified through visible interactive moves. For example, in taking up *power*, *cultural-history*, and *actors* in my findings, I aim to give special credence to interactant constructions over my own, wherever possible.

Power Dynamics between Researcher and Participants

Working with Indigenous communities, particularly youth, as an adult, white, male, conferred considerable social and interactional power to me (Castagno & Brayboy, 2008). It also constrained the kinds of relations I might form with youth. These concerns were doubly accented with the adult-child dynamic, in which I might play forward adult Western practices (perhaps of Whiteness, too) that turn a blind eye to the experiences of Indigenous youth (Fleer, 2004). For this reason, I attended daily debriefs during camp and consulted with elders and the Principle Investigator of the grant to “check” how I was using my positionality.

Validity

In keeping with the ethos of design-based research, both studies aimed toward ecological validity in their design (Brown, 1992). Interaction analysis draws together several families of empirically strong methodologies for studying activity, interaction, discourse, conversation,

communication, and so on, enhancing the empirical strength of the methodology by adhering to practices developed over several decades. Some of the analyses were reviewed with other team members, including occasional video sharing, and through comparison to findings from other studies adopting similar theoretical or methodological frameworks.

Privacy and Confidentiality

The data collected was approved by the Institutional Review Board, as well as by participating Indigenous communities. There were appreciable risks associated with participating. Participants agreed to have their actions video and audio recorded, and the records of these recordings will be kept for analysis, shared at conferences, and potentially end up on the internet (via conferencing). There is potential psychological or community shame if data collection, storage, and retrieval are not judiciously executed. Identities will be masked, but there is always risk that outsiders might infer identities based on available information, breaching the confidentiality of participants.

Data Analysis: Interaction Analysis (IA)

Purpose

Socially mediated RA is theorized as the socially distributed harnessing of the contingency and ostensive marking micro-practices for reflective, referential, and pedagogical communications. The purpose of this study was to use IA to analyze if and how interactants utilized these micro-practices in a learning environment designed to learn I-STEAM through LARP. Given the educational designs of the context, I also analyzed if and how RA was taken up in cycles of play-and-reflection (Salmon, 2016) and in reflective discourse (RD, Cobb et al., 1997).

Stages of Analytic Process

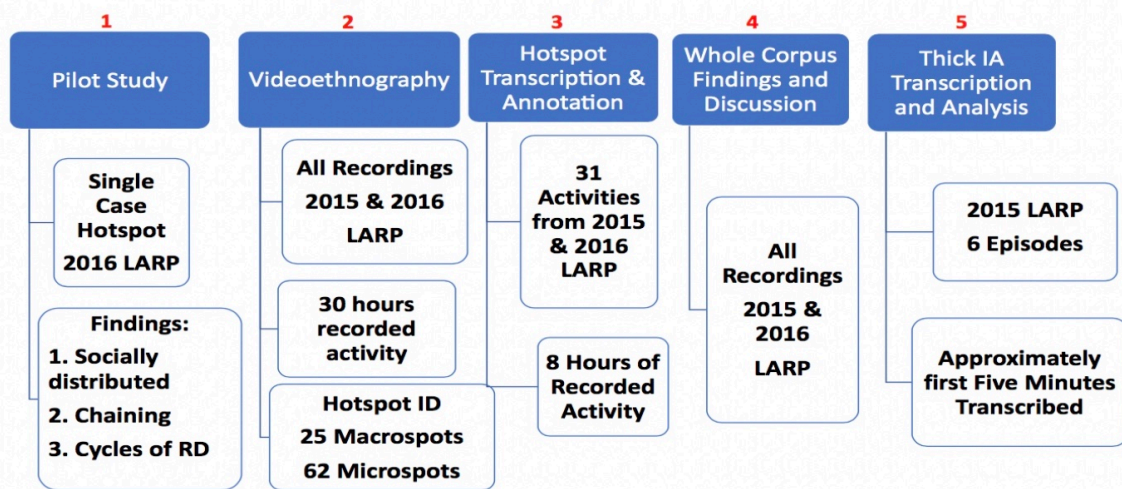


Figure 2. First phase of analytic process

Analytic Process for Entire Corpus

Data analysis proceeded in two phases. The first phase, discussed here, was comprised of five iterations oriented toward analyzing the entire corpus of 2015 and 2016 LARP data (see Figure 2). The second phase, discussed in the next section, focused on six episodes during 2015. In my first iteration of data analysis, based on findings from prior research on pedagogical communications, I focused a host of IA toolkits (see below) on single case hotspot (Schegloff, 1987a), which I identified as engaging and exemplifying the micro-practices of RA (Appendices D, E). Analysis yielded preliminary findings which alerted me to interactive phenomena to consider when studying the entire corpus of data collected during I-STEAM LARP 2015 and 2016. In my second iteration of data analysis, I conducted a video-ethnography of the entire data corpus of I-STEAM LARP, about 30 hours of video and audio recorded activity. Analytic focus during the second iteration was oriented by the findings of the first iteration to identify more hotspots of potentially supportive, contradictory, orthogonal or expansive findings in relation to those findings. During this stage, I identified 25 macro- and 62 micro- hotspots for closer

analysis, totaling 8 hours of recorded activities. In the third round of analysis, I transcribed recordings containing these hotspots at a basic text-of-talk level and organized these transcripts into 31 recorded activities over the two years of I-STEAM LARP. For my third round of data analysis I annotated the texts of these transcriptions (without consulting the original recordings), conducting a textual analysis of spoken discourse for further evidence bearing on the findings from my two first rounds. In my fourth round of analysis, I summarized my findings across all three prior rounds into a generalized textual discourse analysis of the LARP data (Appendix F). In the fifth iteration of data analysis, I organized the 31 transcribed activities into 6 groups. Based on the number and depth of annotations made on selected activities, I thickly transcribed 6 episodes for close IA. Rather than pick representative episodes from different years, I chose to focus on LARP 2015 for sake of continuity across episodes. Overall, data collection for 2015 was more complete than 2016. Thick IA transcription consisted of listening to audio and re-transcribing the original transcriptions using Jeffersonian-inspired conventions, altered to provide empirical insights appropriate to the analytic framework (see Appendix A); watching video and transcribing potentially relevant visible actions into multi-modal transcriptions (inspired by Goodwin, 2018; Jefferson, 2004; Kendon, 1990; Kress, Jewitt, Ogborn, & Tsatsarelis, 2001). Each episode represented one of the 6 groups into which I had organized I-STEAM LARP: Grandmother Cedar Story, MB small group, Gabe Launch, Priya small group, LARP Hike, and LARP Finale. I then analyzed the thick transcriptions of five of the episodes (see Table 3 below and Appendix B) *six more times* using a host of toolkits (see below) to analyze how interactants utilized RA as an interactive resource to accomplish differing and converging interactive trajectories across episodes of designed I-STEAM LARP activities.

Analytic Process for Six Iterations of ‘Thick’ Interaction Analysis

I set out to analyze how interactants utilized RA as an interactive resource for onto-epistemic navigation (Bang, 2015; Marin & Bang, 2018) along various trajectories during LARP activities. Exploring the theoretical lead that the interactive use of “pedagogical communications” (Csibra & Gergely, 2009, 2011; Gergely, 2007) harnesses what Sidnell (2014) calls the “architecture of intersubjectivity” in human interaction, I analyzed the same data four times utilizing IA toolkits to map interactive indicators of primary and secondary intersubjectivity. I relied on six toolkits, which I gloss as *activity*, *interaction*, *discourse*, *conversation*, *play*, and *learning analytics*—though I often call these IA for short. I analyzed how interactants established primary intersubjectivity (Sidnell, 2014) through a mixture of signals marking mutual contingency (Gergely & Watson, 1996), phatic communion (Malinowski, 1918), affect attunement (Beebe & Lachman, 2013), and involvement and engagement (Sidnell, 2014). I also analyzed what it meant for interactants to establish secondary intersubjectivity, when, through joint attention and shared intentionality, interactants opened up interactive spaces for referential actions (Sidnell, 2014). In my fifth iteration of analyzing the data, I analyzed it to develop a coding scheme to highlight the *interactive actions* afforded by marked pedagogical communications, which I gloss as reflective action (RA). I then re-analyzed the data utilizing this new coding scheme, both qualitatively and with a very light quantitative touch, to generate the findings which now comprise chapter six of this dissertation. In the remainder of the current chapter, I walk through the analytic framework and six toolkits I used for the first four iterations of thick IA. In the next chapter, as part of my Findings and Discussions, I work through the coding logics for identifying the interactive enactment of RA.

Table 3

Hotspots and Rounds of Analysis

Hotspot Episode	Day	Lead Facilitator	Group Composition	Group Size	Time Analyzed (s)
Grandma Cedar Story	Monday	Charlene	Whole Group	20+	376
Becoming Cedar	Monday	MB	Youngest age	11	352
Launch	Wednesday	Gabe	Whole Group	20+	334
Small mixed	Thursday	Priya	Mixed age	4	343
Hike	Thursday	None	All youth, mixed age	3	469

Rounds of Analysis

One	Two	Three	Four
Pilot Episode	Video-ethnography	Hotspot transcription & annotation	Data Corpus findings & discussion

Five-Eight	Nine	Ten	Eleven
Thick transcription and IA	IA mapping primary & secondary intersubjectivity	Developed Five Code Coding Scheme	Analyzing Chains and Webs Utilizing Coding Scheme

Analytic Framework

Linking method to theory. Theoretically, I adopt the position that all learning is mediated by social interaction (diSessa, Levin, and Brown, 2016)—whereby social includes human, non-human, and more-than-human (MTH) (inter)actants (Latour, 2005)—ordered

through an “intra-active” (Barad, 2007) “webbing” (Noss & Hoyles, 1996) of layers of semiotic-materials into interactive frames (Goffman, 1974) and substrates (Goodwin, 2018) that are open to further transformation. Methodologically, through multi-modal analysis (Kress et al., 2001) of positioned bodies (Kendon, 1990), materials, conversation patterns, speech actions, and semiotic themes, IA draws attention to what is interactively visible and palpable to interactants. IA thus helps to elucidate the frames and substrates endogenous to interactions, including interactant *stances* toward each other and themselves, as well as toward the situation, setting, and ideational content of the interaction (cf. Goodwin, 2018; Goffman, 1974, 1981; Sacks, 1992; Schegloff, 2007). Furthermore, these toolkits help reveal how frames and substrates are developed in and through continual and repeating interactions shaped by cultural-histories that carry forward particular onto-epistemological orientations, distributions of power, and constructions of agency that include powers to act, affect, and be affected—all of which continually shape situational affordances for situated action, including situated RA.

Table 4

Analytic Tools

Analytic Tool	Definition
Meta-communications	Communications that contain information (explicit or implicit) about how to interpret the interactive communications at hand (Bateson, 1972). This construct is the ideational predecessor to Goffman’s construction of “frame.”
Participation Framework / Structure	Participation framework refers to the different possible roles interactants take in relation to each other during a given interaction (Goffman, 1974), and they imply particular axiological, powered, and cultural-historical orientations.

<p>Frame</p>	<p>A frame is the interactively invoked (often implicit) response to “What is it that’s going on here?” (Goffman, 1974, p. 8), a “schemata of interpretation” that allows an actor to “locate, perceive, identify, and label a seemingly infinite number of concrete occurrences defined in its terms” (p. 21). A frame demarcates perceptions of the space and time of interaction and motivations for how that space and time will be used by interactants (akin to Bakthin’s (1981) “chronotope”). Frames “provide background understanding for events that incorporate the will, aim, and controlling effort of an intelligence, a live agency, the chief one being the human being” (p. 22). Thus, frames imply a particular (socioculturally mediated) theory of agency in play.</p>
<p>Layering</p>	<p>Frames are layered onto each other for synchronic and diachronic interaction through such actions as (re)keying, embedding speech within speech (e.g., quoting), and footing (Goffman, 1974, 1981). Additionally, frames are composited internally by layers within (Thurtle, 2014). If frames are (relatively) static capture of interaction, then double layering of frames, both internally and between, is the dynamic movement of interaction.</p>
<p>Embedding</p>	<p>Multiple frames can be “embedded” (or layered) into an interaction by distancing mechanisms that create narrated worlds of figures who are not spatially and/or temporally part of the present interaction (Goffman, 1981, p. 147). For example, pronouns (“she said...”), hedges (“I wouldn’t...”), verb tense shifts (“I was...”), and qualifiers (“he could have...”) can create distance between speaker and utterance, which embeds a shift in footing toward the utterance within the broader frames of the overall interaction. Through layered embedding, a given frame perdures in the interaction whilst multiple, shifting layers inflect it. Embedding is also a mechanism for communicating stances toward membership categories and modulating speaker voice.</p>
<p>Key</p>	<p>The affective tone of discourse at any given time, in part indicated by tone, prosody rate, rhythm, volume and word choice (Goffman, 1974; Duranti, 1985). Keys (/layers) are marked spatially and temporally, bracketed from beginning to end, and any kind of event or frame can be keyed (/layered), so long as the keying is known to all the interactants, with the effect that a “play” is being made on the outer “reality” frame. Even when keying/layering barely alters the appearance of an event, it can radically shift the experience of the interactants.</p>

Rekeying	Changing/layering the key, or affective tone, of discourse (Tannen, 2006).
Stance	“Stance has the power to assign value to objects of interest, to position social actors with respect to those objects, to calibrate alignment between stancetakers, and to invoke presupposed systems of sociocultural value.” (Du Bois, 2007, p. 139). Interactant stances can be in or out of alignment and may express preferred or dispreferred interactive actions.
Footing	Footing is the response to dynamic occurrences within layered framing: “A change in our footing is another way of talking about a change in our frame for events” (Goffman, 1981, p. 128). “[a] change in footing implies a change in the alignment we take up to ourselves and the others present as expressed in the way we manage the production or reception of an utterance” (p. 128). A change in footing is both executed by and executes shifts in the participation framework of the interaction and in the production format of the interaction (p. 146).
Membership Categories (MCs)	MCs include identities, categories, nominalizations, places, topics, themes, events, and explicit frames that can be mapped by the criteria outlined in Stokoe (2012), including category-bound activities (e.g., boys play-fight), category-tied predicates (e.g., mothers care), and standardized relational pairs (e.g., parent-child), among others. MCs reveal cultural-historical orientations of interactants and are a resource for the reification and negotiation of these orientations.
Voice	Voice conveys motivations and stances of the speaker. “This is the speaking personality, the speaking consciousness. A voice always has a will or desire behind it, in its own timbre and overtones” (Bakhtin, 1981, p. 434).
Enactment, Affect, Feeling	“Enactments” are interactive expressions of “thoughts, feelings and attitudes which are internal and affect-laden assessments of a prior utterance or event” (Fox & Robles, 2010). The “effects of interaction,” or affects, are in of themselves “events” (Spinoza, 2001; Massumi, 1995). Enactments thus include affect-laden assessments of interactive affects. As assessments of ongoing interaction, enactments also reveal interactant stances toward the interactive frames in play.

Analytic toolkits. To analyze the data, I conducted analyses using IA toolkits designed for several complementary scales of learning and interaction: activity, interaction, conversation,

discourse, play, and learning. Table 4 defines key analytic tools drawn from across these toolkits to help map the powered and cultural-historically mediated onto-epistemic navigations (Bang, 2015; Marin & Bang, 2018) and semiotic actions of RAs during LARP.

Following Jerolmack's (2009) suggestion for analyzing play-and-reflection through a non-anthropomorphic lens, I analyzed video and transcription strips, chunks, cycles, and episodes of recorded interactions during designed learning activities utilizing the (1) space between the actors, (2) the place in which interaction takes place and (3) the time allotted for play episodes to generate inferences about (4) mental capacities of actors to engage RA, (5) personal sociocultural histories of the actors shaping content and action, and (6) relationships of the actors shaping possible distributions of power and interaction frameworks. All activities, design and otherwise, were comprised of interactions and intra-actions in continual cycles of action continuously varying across familiar trajectories, a process operationalized in this study as onto-epistemic navigation (Bang, 2015; Marin & Bang, 2018). In the following discussion, I walk through the logics drawing these particular toolkits into my analytic framework.

Activity analytics. At the level of "activity," I analyze the *activity system* (Goodwin, 2018) comprised of both inter-activity and intra-activity, which taken together offer a perceptual semiotics (Adkins, 2015) of how activity systems are endogenously webbed through intra-active assembling of semiotic-material layers of the *interactive substrates* (Goodwin, 2018) orienting and organizing activities. The ongoing interaction is the interaction-at-present in a given point of data analysis and has open durations even if the activity itself limits those durations. Such openness affords emerging actions, including speech and body actions of interactants. Through intra-action, interactants co-operatively web their situational context to their interactive substrate through contextual configurations of semiotic-material layers (cf. Goodwin, 2018). Through the

intentions of their actions, interactants select out intentional and discursive objects for orientation, more or less mutual. The selection and constitution of these objects is mediated by cultural-historical resources patterned into webs of embodied formations, social orders, conversation patterns, semiotic content, material arrangement, and so on—each of which is made interactively visible for others to perceive, and thus potentially visible to video IA.

Interaction analytics. Interaction analytics help respond to basic questions about interaction such as how social interactions are ordered and what kind of ‘work’ interaction accomplishes (Goffman, 1974, 1981). For the purposes of analyzing RA, I focused on how interactants proposed and negotiated frames for interacting, achieving more or less alignment (Goffman, 1974). Participation frameworks (Goffman, 1974, 1981) included roles expected of participants and frames for making meaning out of the semiotic fields layered onto the contextual configuration (Goodwin, 2018) of the interaction. Interactant resources for negotiating and layering/laminating frames (Goffman, 1974) included proffering meta-communications/contextualization cues (Bateson, 1972; Gumperz, 1992) that expressed preference/affiliation or dispreference/disaffiliation (Schegloff, 2007) for projectible actions (Schegloff, 2007) following particular frames.

I also analyzed for how interactants harnessed the laminatory powers of interaction to shape the projectible trajectory of interaction through double-voicing (Bakhtin, 1981), decomposition and reuse (Goodwin, 2018), keying (Goffman, 1974), footing (Goffman, 1981), embedded speech (Goffman, 1981). In educational practices, for example, teachers might decompose and reuse portions of student turns-at-talk to help orient reflective attention in a particular way toward a subject matter (Handsfield & Crumpler, 2013). Each of these tools

expands the combinatorial potential (Goodwin, 2018) of how interactants can shape the trajectories of interactions unfolding across designed learning activities.

Conversation analytics. To map the “progressivity” interactions in the data, I analyzed how interactants (a.k.a., interlocutors, respondents, participants, so on) temporally structured their interactions through turn-taking, turns-at-talk and turns-at-interaction, turn design, turn-construction-units, sequentiality, addressivity and adjacency, preference, projectability, accountability, and repair (Schegloff, 2007). Turn design in particular, helped foreground how interactants utilized conversational pragmatics and discourse content to express preference for and accountability to particular projectible trajectories of interaction. Turn designs included adjacent pair bids/calls for response and responses that ratified such bids. Turns could also be interrupted, by the speaker or another person. Self-interruption (anacolutha) was a particularly salient feature of marking that a speaker was actively reflecting on word choice, evidenced through self-repair (Schegloff, 1992).

Discourse analytics. The interactive speech actions of discourse were analyzed through discourse analytics. At the level of the utterance, interactants used keys (Goffman, 1974) and ideational content of turn-design to signal stances (Goffman, 1974) toward each other and frames of interaction. Paralinguistic analysis helped elucidate the vocalics of prosodic laminations of tempo, rhythm, and tone that interactants used to key frames and stances (Bloome, Carter, Christian, Otto, & Shuart-Faris, 2005). Analyzing key helped distinguish “pretense” from “reflective” tones of voice used by interactants. Analysis of metapragmatic markers (Silverstein, 1976), including epistemic modals (e.g., “I think”), also helped mark when interactants were speaking with a “reflective stance” (Slade, 2007). Gesture was closely tied to discourse, a multi-modal resource interactants used as a complementary and generative companion to discursive

content (McNeil, 1985). For example, environmentally coupled gestures (Goodwin, 2018) were often paired with deictics in spoken discourse (Lester, Towns, Callaway, Voerman, & FitzGerald, 2001). Deixis was also used to point to prior speech actions.

Play analytics. Play was specifically analyzed multi-modally for keys and tones of bodies and speeches that conveyed playful affect (Cekaite, 2008). Laughter was a key indicator of playful affect and smiling was highly correlated with play (Haakana, 2010). Frames of play were meta-communicated through such keying, though frames were also formalized into ‘rules for play’ (Giffin, 1990). Play discourses bound by rules included role-plays that ‘storied’ play with narration (Cohen, 2011, 2015). In such role-play, the narrative storying of play was laminated with playful embodiments that enacted character roles. Through speech and body, players could stand *in the frame* of play, talking and acting “with” a first-person perspective, on the *rim of the frame* (Goffman, 1974) narrating how to play within the *playworld* (Lindqvist, 1996) would unfold, and *out of frame*, attending to non-play related interactive layers (cf. Fine, 2002; Goffman, 1974).

Pedagogical communications and the architecture of interactive intersubjectivity.

The theory of pedagogical communications is specifically interested in how interactants utilize turn-design to mark their turns-at-interaction to develop pedagogical stances for ostensive-inferential communications (Csibra & Gergely, 2009, 2011; Gergely, 2007). Such markings include contextualization cues and meta-communications that signal specific contingent responsiveness to a turn and general contingent relationality across interactions and even whole relationships. Contingency is often signaled through mirroring (Futó et al., 2004), as well as through laminating resources of double-voicing, decomposition, and reuse. Contingency signaling helps to establish and maintain the phatic connection of the interaction. Tracking

phaticity through voice, keys, and prosodic laminations of tone and tempo helped to analyze how the phatic connections of interactions afford and shape reflective potentials during ongoing interactions.

The theory of pedagogical communication also posits that interactants use ostensive markings to “shift” or “modify” their communications to signal ostension toward reflective, referential, and pedagogical spaces (Csibra & Gergely, 2009, 2011; Gergely, 2007). Thus, analytically detecting ostensive marking is central to identifying RA. Ostensively marked interactions include the attentional directives of interactively palpable deictic gestures (Louwerse & Bangerter, 2005), coordination of speech actions with embodied actions to enact turn-taking inflections of projectible interactive potentials (Goodwin, 2018), prosodic laminations of tonal inflections akin to “motherese” in parental pedagogical communications (Gergely, 2007), or embodied actions akin to as “motionese” in parental pedagogical communications (Gergely, 2007).

Unit of analysis: Reflective action. In theory, RA harnesses the structural resources (layered assembling) of social interaction for pedagogical communications through three micro-practices:

- building a phatic connection through contingently responsive marking
- ostensively marking a break or disruption to the phatic frame to open up an informative space
- layering informative communications onto phatic connections

Each of these micro-practices has signature components that I examined for their commonality and variability within and across LARP settings. My preliminary RQ for IA was: *When and where are “reflective shifts” occurring in the interaction?*

My analysis started with identifying candidate “shifts” or “modifications,” demarcating the movement from relatively phatic and to relatively informative. To look for interactive indicators that a shift had occurred, I considered any ostensive marking involving speech or body modulations (Gergely, 2007); explicit adoption of prior discourse as object of current discourse (Cobb et al., 1997); “modifications” of prior interactively expressed thoughts, feelings, or perceptions (Duranti, 2009a); metapragmatic and epistemic modals such as *think*, *wonder*, *guess*, *feel*, etc., signaling mental processing (Leslie, 1987; Silverstein, 1993; Wortham, 2001); enacted assessments of prior utterances or events (Fox & Robles, 2010); evaluations or modifications of membership categories (Sacks, 1992; Stokoe, 2012); and other indicators of interactive uptake of “reflective objects” as identified in extant literature on reflection (e.g., Davis, 2003; Fonagy et al., 2002; Marin & Bang, 2018; Zeichner & Liston, 2013).

For the reflective shift itself to be interactively valid, I searched for evidence that such shifts were ratified (Goffman, 1974) and oriented to as such by the interactants (Schegloff, 2007). If such shifts appeared interactively ratified, I worked from those shifts forward and backward in time to identify relatively phatic and reflective aspects of the interaction. Thus, rather than analytically treating certain kinds of interactions as inherently phatic or pedagogical, in theory, any interactive moment could be either, relative to the shifts, since all interactions and communications have both phatic and informative aspects, with variable foregrounding of either. In short, what is reflective and pedagogical in one instance can become the phatic grounds for another reflective shift in the next, all determined by the endogenous meanings attributed to and displayed by interactants.

Given that I-STEAM axiologically foregrounds conducting learning science research with Indigenous learners, and given that prior work by Indigenous scholars has highlighted the

importance of “attentional directives” in the experiences of Indigenous learning (Marin & Bang, 2018), ostensive communications were analyzed for how they oriented interactive attention in particular axiological directions, when empirical expressions of axiological positions were clear to me during analysis.

Once I had identified reflective shifts, in subsequent iterations of IA I pursued several follow-up questions:

- 1) How were reflective shifts being used in the interaction?
- 2) What were the reflective shifts “doing” in the interaction?
- 3) What “speech actions” were they accomplishing?
- 4) To what ends?
- 5) For whom?
- 6) With whom?

Given that theory predicts that reflective shifts entail a pedagogical transformation of phatic connection, determining *what* had been transformed helped answer questions about the functionality of the shifts to the interactants. To consider what had been transformed in and through the interaction, I asked how interactive frames and layers, stances and footing, keys, affects and enactments, participation frameworks, voices, and membership categories changed across shifts (see Table 4). By responding to these questions, I was positioned to consider how these constructs were being interactively assembled, patterned, negotiated, and transformed across relatively phatic and informative phases of interaction.

While I theoretically posit that “reflective objects” are specifically targeted in reflective shifts and transformed through RA, I was interested in both explicit transformation of target objects, which may include any of the analytic constructs outlined in Table 4, as well as any

implicit transformations of the same analytic constructs. Given how membership categories and enactments link the scale of situated interaction to scales of broader (and partially determinative) sociocultural processes and distributions of power and agency, transformations of membership categories and enactments, as well as frames or stances vis-à-vis membership categories, helped to provide insights into how RA was oriented to and transformed sociocultural layers of the interactive substrate—including semiotic fields, semiotic-material arrangements, and semiotically ordered distributions of power and agency.

Unit of analysis: Reflection-and-play. Theoretically, the interactive assembling of *play-and-reflection* takes up and transforms mediating, socioculturally historicized semiotic-materials for the sake of that situated instance of play, according to its situative affordances (e.g., van Oers, 2013). Furthermore, theory on the assembling of *play-and-reflection* predicts that play involving interactively analyzable reciprocal and progressive relations among players *expands* playful-learning (Salmon, 2016). To analyze these theoretical positions, utilizing the “play analytics” toolkit (see above), I considered how playful interactions *keyed* interactive *frames* (Bateson, 1972; Goffman, 1974) and looked for how play-and-reflection were distributed across the three core micro-practices of pedagogical communications.

Phatic connection:

- contingently responsive timing between players builds reciprocity of play
- developing phatic communion through play builds progressivity of play
- reciprocity and progressivity of play relations requires, and advances, alignment of collective intentionality

Ostensive marking:

- reflection is layered into play through spatiotemporal intensive disjunctions (e.g., reflective pauses)
- ostensive marks function to “decouple” in-frame pretense play from out-of-frame reflective action, affording reflective time-spaces for referential communications
- stepping in and out of frames of play adds layers to play-and-reflection

Informative communications:

- play requires implicit functional dependencies in material-semiotic links (Otsuka & Jay, 2017) that afford reflective learning opportunities through explication (see also Lee, 2001)

In practice, analyzing both units of analysis, RA and play-and-reflection happened concurrently, which is consistent with how they unfolded during real-time LARP activities. Appendices B and E provide the full data analysis of the hotspot episodes, backing the claims and findings I advance in the next chapter using the analytic toolkits outlined here.

Cautions and Limitations to Research

In theoretically framing social interaction, I had to carefully draw out a *distinction* between my claim that interactants meaningfully construct their interactions endogenously *and* what I theoretically believe affords the layered assembling of social interaction. In other words, while I posit theoretically that interactants construct the interaction, I still must articulate how they do this, and such an articulation may differ from how interactants might indicate their orientations to such assembling (identifiable through IA), or explicitly articulate such an assembling from their perspective. This distinction matters on several related points. For example, while I posit that RD harnesses the layered assembling of social interaction for pedagogical communications, interactants may not believe they are engaging in RD, or if they

are, they may not believe they are harnessing the layered assembling of social interaction.

Ultimately, my methodological commitment to IA affords me some grounds, after data analysis, to assess the proximity or distance between my claims about how interactants utilize the micro-practices of RD and how interactants appear to do so through IA. Furthermore, member-checking (Miles, Huberman, & Saldaña, 2013; Merriam & Tisdell, 2015) affords further checkpoints on said proximity or distance, though limited availability of members limited my ability to engage member-checking.

However, several caveats about privileging interactant review merit my carrying forward an analytic framework as to how social interaction is accomplished and how RA may be accomplished through social interaction. First, interactants may not be conscious of all the processes involved in the webbing and assembling of social interaction. Indeed, from a psychodynamic perspective (Bruschweiler-Stern, Lyons-Ruth, Morgan, & Nahum, 2007), they may even defensively deny (with great intensity) certain mechanisms of assembling that arouse intense affects to think about. They may not be conscious of how cultural-history and power are already in motion in the assembling, again because either they are simply unaware or unconsciously motivated to ignore. This distinction between how I posit social interaction is assembled toward particular ends, and how interactants themselves appear to interactively orient themselves through frames and stances to the interaction, must be kept in mind, at times explicitly, in both the theorizing done here and in the forthcoming analysis of the data in the dissertation.

Chapter Six: Data Corpus Findings and Analysis

This chapter is broken into three parts. In the first part, I will summarize the major finding, the complexity of which requires three interdependent sub-findings. In the second part, I will review each of the three sub-findings in depth, reproducing relevant parts of my analyses which are presented in full in Appendices B, E, and F. In the third and final section, I will reflect on these findings.

Findings Summary

The overarching major finding, which I break into three interdependent sub-findings, is that the **plastic structure of reflective action (RA) makes it a malleable interactive resource for laminating layers of onto-epistemic meaning onto I-STEAM substrates through RD chaining**. To break down this finding, I will first decompose the plastic structure of RA that gives it such malleability, examining how it emerges from situated interaction and how it affords varying trajectories of situated interactions. Second, I will give an overview of how the plasticity of RA affords *RD chaining* of cycles of interaction, an interactive resource for onto-epistemological webbing that makes the contingent relationality of an interaction marked and visible, enhancing interactant capacity to act with collective intentionality toward particular ostensive directions. Finally, I will diagram chains of semiotic action ostensibly mediated by RA, mapping its variations with a preliminary review of the situative conditions that appear to contribute to such variability.

1. Structure of RA is Plastic and Malleable

The first major finding elucidates how the plastic structure of RA affords considerable variability in its situated use. Across the data, interactants harnessed the contingent-ostensive signaling of pedagogical communication to decompose and interactively distribute its phatic-

referential structure toward both autonomic and intentionally reflective ends. Mapping this distribution motivated me to create a five-component coding scheme that I elaborate below, which in turn made micro-cycles of RA directed toward the same RO substrate more visible to me. A key finding here was that the interactive decomposition of RA afforded variable laminations of keys and frames of interaction—specifically pretense and reflective keys. Overall, the finding here illustrates how the combinatorial potential of RA afforded significant plasticity to fit the situational conditions of its enactment.

2. Chaining Cycles of RA Expands Learning

The inherent plasticity of RA afforded *RD chaining* of cycles of interaction that made the contingent relationality of interactions marked and visible, enhancing interactant capacity to act with collective intentionality. In this finding, I analyze the structure of chaining as an onto-epistemic webbing practice in which semiotic actions by an interactant are reused or deictically integrated into subsequent interactant turns. Thus, I found that chaining actions have the double power of laminating highly marked interaction contingency within substrate-expanding RAs.

3. RA is an Interactive Resource for Webbing and Chaining I-STEAM Substrates

The third major finding, which follows from how the structural plasticity of RA affords webbing and chaining, is that RA was a highly malleable interactive resource for progressively moving along LARP activities according to their situational contingencies. RA afforded and was afforded by at least three layers of ‘double-laminations’ during context-specific onto-epistemic navigations of I-STEAM LARP.

- 1) Narration-and-embodiment
- 2) Play-and-reflection
- 3) LARP-and-I-STEAM

By laminating RA with other interactive resources, such as the grammar of the English language, I-STEAM LARP participants navigated these double-laminations to develop emergent theories about ecosystemic relations and actions. By chaining micro-cycles of RA that continually re-used, decomposed, transformed, and layered I-STEAM connections, interactants generated macro-cycles of RA that transformed and expanded their initial activity substrates. Thus, the third finding, evidenced throughout the data, is that chained discourses were highly correlated with maximum group participation and expansion of I-STEAM themed substrates.

Finding One: The Structure of RA (Unit of Analysis)

Theoretical Framework

The theory of RA developed in Chapter Three was grounded in the theory that pedagogical communications harness phatic, ostensive, and inferential properties of communication *first* by signaling (through interactive marking) the contingent relatedness necessary to establish the phatic connection of an interaction, and *then* ostensively marking communications to orient to a reflective time-space in which referential, reflective, and pedagogical action can take place. For short, I refer to this as the doubly-laminatory power of RA, laminating both contingent and ostensive signals into interactant communications. As interactants initiate the phatic connection of an interaction, frames are advanced, negotiated, and aligned, shaping the trajectories and possibilities of RA. What I have posited in formulating a theory of RA is that as a form of pedagogical communication, RA itself must be *interactively marked* and *socially distributed* so as to facilitate *joint attention* (or, “mutual orientation” (Goodwin, 2018)) and *collective we-intentionality* (Rakoczy, 2008) directed in particular reflective, referential, and pedagogical directions. Thus, the grounds for evaluating this theoretical framework lie in the analysis of empirical data.

In the I-STEAM LARP data, during interactive frame negotiations at the start of each activity, when projectible frames for mutual orientation were yet to be interactively settled, signals of contingent interactivity abounded, evidenced in part through marked addressivity and adjacently paired turns necessary to engage in negotiating interactions (see Appendix B). More broadly, across all sustained interactions in the data, contingent interactivity was characterized by *attunement to*, *involvement with*, and *engagement in* the unfolding activity, characteristic of what Sidnell (2014) calls the “primary intersubjectivity” of social interaction. Contingent

relationality was part and parcel of not only setting up interactive spaces for RA, but was also continually laminated back into the ongoing activity to facilitate more and more expansive RA.

Data Overview

As discussed in the Methods chapter, six episodes were thickly transcribed, and five of these episodes were analyzed utilizing IA toolkits. Table 5 provides an overview of general characteristics of the five core episodes. The first episode, Grandmother cedar story, involved all participants in the camp (about 25 youth) with several adult facilitators present, and two adults leading this particular activity (Gabe and Charlene). Youth ranged from 5-18, identifying with over twenty tribes, such as Tlingit, Haida, Kiowa, Navajo, Katzie, Cherokee, Ojibwe, Tulalip, and Creek. One youth, Marvin, was chosen as the primary youth participant in the telling and embodied enacting of the story, though all youth were encouraged to participate through the activity structure. The purpose of the activity was to enact and reflect on the Grandmother Cedar Story, a Samish story brought to the camp by native storyteller Roger Fernandes, a member of the Lower Elwha Band of the S'Klallam Indians, centering themes of land-based relationship in Indigenous ontology, the centrality of plant relatives to Indigenous knowledge systems, and axiological values of roles, relations, responsibilities, and reciprocity. Telling the story functions multiply in the context of the camp: (1) it practices the Indigenous value of knowing through storytelling; (2) it orients the participants toward land and plant-based relations; (3) it provides a crucial link between the first two functions, as traditional Indigenous onto-epistemic practices, and the introduction of LARP as a relatively new practice that foregrounds storying through spontaneity and embodiment.

After the telling of the story, the group reflected on its axiological value, and Gabe prepared the group to harness the story as a reflective object for further onto-epistemic

Table 5*Hotspots for Data Analysis*

Hotspot Episode	DAY	Lead Facilitator	Group Composition	Group Size	Time Analyzed (s)
Grandma Cedar Story	Monday	Charlene	Whole Group	20+	376
Becoming Cedar	Monday	MB	Youngest age	11	352
Launch	Wednesday	Gabe	Whole Group	20+	334
Small mixed	Thursday	Priya	Mixed age	4	343
Hike	Thursday	None	All youth, mixed age	3	469

exploration of plant ecosystemic relations in forthcoming activities. The second episode started immediately after Grandmother Cedar Story. MB, the principal investigator of I-STEAM camp, lead a small group of the 11 youngest participants in the camp, aged 5-8, identifying with over ten tribes. Charlene helped co-facilitate and Gabe joined the group intermittently throughout the activity. Participation was distributed widely in the group as they explored with their words and bodies storying the life cycle of cedar. The third episode was Wednesday of that week, in which Gabe lead a launch activity to help the whole group reflect on the purpose and value of I-STEAM LARP. Again, youth of all ages (5-18) identifying with over twenty tribes were present, though participation was much more subdued during this activity, focused primarily on Gabe's speech actions without embodiment or storying. The fourth activity, on Thursday, was a small group of three lead by Priya. The youth ranged in age from 7-11, and each participant had at least one common tribal affiliation. While Priya lead the embodied storying of blackberry and salmonberry life cycle and scenario responses, youth participation was frequent and active. The

fifth episode shifted focus to three boys on a LARP hike. This was distinct from other episodes because it was all one gender, all youth with no adult facilitators, and transpired during a hike as opposed to anchored to a single location. The youth ranged from ages 7-12, and the younger member (Marvin) belonged to the same tribe as one of the older boys (Ninja). The hike focused on determining and enacting keystone plant relatives of the local ecosystem. The third finding (below) expands analysis to the LARP Finale. However, the Finale is difficult to analyze as a single episode, given how much time it covered, its spatial dispersal, and data collection methods that continually shifted across mobile intra-activities. All youth of all ages and tribal identifications participated, as well as many adult facilitators. During the Finale, participants engaged in fully immersive play-enactment of a Pacific Northwest ecosystem over many seasons and years.

Data Analytics

Analysis (Appendix B) of data demonstrated how RA functioned on multiple layers:

- 1) it maintained the contingent relatedness of the interactants
- 2) its plasticity enabled socially distributed and multi-modal activation during play-and-reflection activities
- 3) it surfaced pre-reflective actions with the potential to become reflective objects through subsequent RA
- 4) it helped to transform the initial activity substrate along trajectories shaped by designs toward particular learning outcomes

By analyzing the social distribution of contingent-ostensive marking across the data, I developed a five-component coding scheme mapping how RA is a conjunction of *phatic communications*—comprised of phatic connectors (PCs) and communication continuers (CCs)—

and *referential communications*, comprised of adjacent pair dyads of reflective prompts (RPs) and reflective responses (RRs), as well as reflexive communications (RCs) chained to RP-RR pairs, all directed toward reflective objects (ROs). ROs were central to the link between RA and the onto-epistemic action of I-STEAM LARP, a finding explored briefly toward the end of this section and at length in the Third Finding. My first major finding was how the coding scheme for RA helped reveal RA in I-STEAM LARP.

Coding Logics for Reflective Action (RA)

The following five codes were identified throughout the official transcription (Appendix C):

Gray (PCs; phatic connectors)

Purple (CCs; continuance communications)

Yellow (RPs; reflective prompts)

Blue (RRs; reflective responses)

Green (RCs; reflexive communications)

Interactions always started with contingency signals initiating the phatic connection to the interactive substrate. By definition, PCs, CCs, and RPs are all capable of emitting interaction-initiating contingency signals. Across the data, PCs were always the activity-starting communications, as facilitators needed to bring the group together to orient to the facilitators themselves. Thus, LARP interactive substrates were initially oriented toward establishing interactive frameworks. However, rather quickly, ostensive marking began to direct interactant attention toward reflective orientations to contextual configurations of I-STEAM LARP. All LARP activities exhibited fairly quick movement to RA, even if it was in the service of the relatively phatic orientation of collectively establishing and/or negotiating how to frame the

forthcoming activity (Appendix B). RA during these *relatively* phatic interactions was doubly marked, laminating contingency signals and ostensive indicators of the activity trajectory.

When they emerged, reflective prompts (RPs) marked reflection-initiating sequences built out of the initial phatic connection. Clear initiations of RA were coded as RPs, and all RPs, by definition, encoded calls for reflective responses (RRs). RRs were thus always seen in response to RPs (see Figure 3). RPs that didn't finish their turn and went unratiified were coded as communication continuers (CCs) because they carried in them the potential to be taken back up again in subsequent interaction. More generally, the interactive function of a CC was to continue the interaction without clearly initiating RA (Figure 3), and thus CCs included *backchannel continuers* (Yngve, 1970). Reflexive communications (RCs) were reflective communications reflexively *chained* to prior RA, and added *new* information. Rather than prompting RA, RCs continued RA. Communications that functioned like RCs but that did not add new information were also coded as CCs, which included RCs that were interrupted before they could relay what was new. Taken together, these five constructs model how interactants generate a micro-cycle of RA, which is to say a socially distributed response to a single reflective object (RO) foregrounded by a RP.

Analytic distinction between contingent and ostensive marking. The interactive markings of contingency and ostension, although always laminated with each other across the RA of pedagogical communications, were often distinctly marked. Thus, analytically, an interactant-based distinction could be made between contingency and ostension. Findings begin by exploring this analytic distinction and continue by hinging on this distinction to analyze the prompts that pivoted, shifted, and modulated toward RA, and the ways in which these prompts were taken up, or not, and continued, or not.

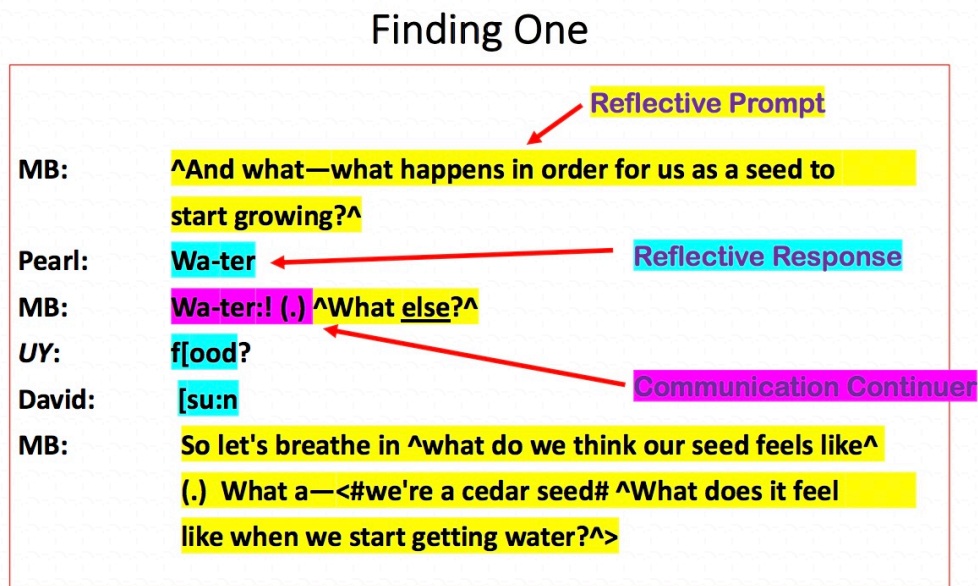


Figure 3. Coding RA

Data Analysis

Phatic Connectors (PCs) and Contingency Marking

Gray (PCs; phatic connectors)

Phatic communications negotiating the activity framing, interactive substrate, and participation frameworks were most visible during activity frame launches and negotiations. In turn, contingency markers appeared to be the most prominently marked phatic communications. Indeed, the data evidenced how *all* activities began with PCs that established the contingent relationality of the interactants toward each other while ostensibly cuing the forthcoming interactive substrate (Appendix B). Such actions doubly-laminated a participation framework (who participates and how) and an attentional orientation (the substrate). For example, here Gabe starts the activity titled “Grandmother Cedar Story” by establishing contingent relationality to Charlene and anyone “who can remember a story,” marking both participation structure and orientation toward interactive substrate through his contingency signaling (see Appendix A for transcription conventions).

- 1 **Gabe:** [((Gabe clasps hands together into an interlocked fist in front of his mouth
2 and scans the group turning his head repeatedly left to right))
3 [so (..) ((exhale))
4 I'm gonna need (.) Charlene—#actually I'm going to need (.) just about
5 anybody's help who can remember >a story<# (.)
6 ((exhale))
7 uhh (.) not everybody apparently
8 [((rubs hands together just to the left of his face))
9 [got to hear all uh (.) all of the stories that were:
10 to be told <one of them> #particularly important#
11 (.) ^can e—can anybody remember the story about the >Grandmother
12 Cedar^<?
13 **Multiple:** [((about five hands are raised))
14 [^ME:^

The framing leading up to and during Gabe's activity-launching question, along with the wording of this question, collectively signals an invitation to group members to join in a particular kind of co-operative action. As he is establishing contingent relationality, Gabe is also laminating onto these actions his orientation toward the interactive substrate. Gabe's bid appears to direct the mutual orientation of the group toward the interactive substrate of telling Grandmother Cedar Story. As he speaks, Gabe appears to have an activity in mind involving the telling of ">a story<" (line 5). His slowing prosody as he utters "a story" ostensibly marks it for interactive orientation. He has pre-marked what action is to take place—telling a story, and he has marked the participation structure—anyone "who can remember." Thus, Gabe's move doubly laminates the interactive substrate with a discursively visible link between people who remember the story (attentional orientation) and people who can participate in telling the story (participation framework).

The discursive termination of Gabe’s RP marks the end of his conversational turn (line 12), and the question itself interactively signals its own termination as an adjacently paired turn calling for response from other interactants. The interactive ratification of Gabe’s bid for interactants to participate is signaled by the response to his solicitation: five raised hands with one or more youth shouting “^ME:^” (lines 13-14) signal strongly contingent relationality among several participants in terms of (1) listening and attending to Gabe, (2) willingness to respond to Gabe interactively by signaling back to Gabe their contingent responsiveness to him, and (3) their affirmative response to the question of their recollection of the story implying their willingness to participate in its telling. This strong and positive collective response affirms that contingent relationality is interactively vibrant and that a positive phatic connection among several participants is in motion.

How activities were framed during launches shaped observable phatic connections, reflective potentials and actions, and epistemic actions. With the exception of the episode titled “Gabe Launch,” at the start of every adult-led I-STEAM LARP activity, facilitators utilized RA for the relatively phatic tasks of laminating (1) interactive frames of co-operative action toward the interactive substrate of their situated and endogenous activity system; (2) a play frame of being a plant relative with their bodies, which itself involved players (a) *on the rim* of the frame *narrating* how to mediate playful actions with their bodies during (b) *in-frame* role-play of *being a plant*; and (3) a pedagogical frame oriented toward I-STEAM learning objectives. In the following example, Priya exemplifies all three of these tasks as she guides the group toward embodying salmonberry seeds.

- 15 **Priya:** **So what if you start out as just like a little**
- 16 **[((sits down on grass in shade near a boundary between field and thick flora))**
- 17 **[baby salmonberry where you're like this big?**

- 18 **[(.) or a little baby salmonberry**
- 19 **Multiple:** **[((Regan and Jake both sit down side by side forming a shaded o-space**
- 20 **with Priya))**
- 21 **((Regan keeps upper body upright and Jake lays upper body on ground with**
- 22 **knees pointed up))**
- 23 **Priya:** **[an:d <you're just a tiny little baby>**
- 24 **Alvin:** **[((As he makes a nonvocalic playful noise that sounds like “wee”, Alvin sits**
- 25 **down and falls backwards about 10 feet behind Regan and Jake, in the sun,**
- 26 **and then curls up into fetal position and tips to his side))**
- 27 **Priya:** **[((looks down at notes on salmonberry page))**
- 28 **[an::d (.) you start off as what (.) <a seed>?**
- 29 **Regan:** **uh huh**
- 30 **Priya:** **Yeah, you start off as a [see:d and you sprou:t (.)=**
- 31 **Alvin:** **[I'm gonna be a seed!=**
- 32 **=(((Alvin lifts upper body up from seed position, maintaining lower body**
- 33 **in fetal position))**
- 34 **Priya:** **=[an::d let's say you sprout like right in like this >sunny slash shady<**
- 35 **spot. *It's like both sunny and shady.* And then you start growing**
- 36 **a little bit and you're like >really young<**

Priya initiates an in-frame role-play activity with four micro-cycle initiating RPs that comprise a single macro-cycle enveloping multiple layers: (1) she sits down, signaling that they are done walking and ready to anchor physically into the activity (line 16); (2) she shifts pronouns from talking about plants in the third-person to addressing the students in the second-person as plants (line 15 onward); (3) she pivots on the conversation about place, sun, and shade by chaining onto Alvin's RR and segues into the in-frame activity (line 34-36). Thus, Priya's moves also exhibit how facilitators can create pivots from out-of-frame actions to launch into in-

frame actions, particularly by chaining onto the discourses initiated by the students and converting the out-of-frame RAs into in-frame ROs.

As she narratively positions the group as baby salmonberries, emphasizing “baby” by saying it three times in her RP, Regan and Jake sit down in the shade facing Priya to form a small o-space between them. Alvin sits about ten feet behind Regan and Jake, in the sun, facing Priya, while making a “weee” sound and curling up into a fetal position as Priya emphasizes “baby.” In short, only Alvin appears to already be reflectively embodying Priya’s narrative prompting. At this point, the group is comprised of two transactional segments: between Priya and Alvin, who are far apart but already adopting the play layer, and Priya and Regan and Jake who are close together demarcating a clear o-space, yet not entirely aligned with the play frame. The 3 layers seen in other LARP activities is interactively marked here as well in (lines 15-18): (1) inside the play frame marked by equating youth as “you” and “salmonberry”; (2) on the rim of the frame signaled by narration play-planning talk; (3) outside the play frame and inside the I-STEAM content learning frame, activating mutual orientation to salmonberry.

After establishing the initial frame and positioning participants as “baby salmonberries,” Priya layers on the idea that salmonberries start as seeds (line 28). Alvin ratifies Priya’s implicit RP to embody with embodied responses (lines 24-26, 32-33), whereas Regan and Jake wait about 60 lines (not shown here) before they start enacting salmonberry in-frame. Alvin’s quick adoption may harness multiple resources: (1) This is the third day this week they are doing this kind of activity and he’s practiced it before with the youngest group, which displayed the highest intensity of affective play; (2) through these prior activities, he’s learned the contextualization cues (e.g., pronoun shifts) and embodiment cues which correlate with particular narrations, and thus knows how to recognize RPs encoded in narration and how to offer RRs with his body; (3)

in building the phatic connection of this activity, Alvin demonstrated his willingness to respond quickly and appropriately to Priya's RPs.

Priya then embeds an explicit prompt that likely functions to ensure the group is still mutually oriented to Priya's extended prompt (lines 23, 28, 30), illustrating again how interactants can use RA to maintain the mutual orientation of the interactive framework, and not just to transform the substrate.^v Priya begins laminating onto the word "baby" the word "seed," linking a more common I-STEAM frame for thinking about plant life cycles. Thus, the RP itself does the primary RA, seeking ratification from the respondents, which Regan provides (line 29). Priya then chains to this position and layers on the next sequential move in the salmonberry life cycle: sprouting (line 30). As she does this, Alvin responds to her prompt to be a seed with first-person narration while embodying the seed icon he had practiced during LARP two days earlier (lines 31-33).^{vi} Priya continues, overlapping to some extent with Alvin, as she presents the next prompt to reflect upon: sprouting in a ">sunny slash shady< spot" and beginning to grow "a little bit" (lines 34-36).

Priya's multi-turn macro-RP here folds together several layers in one move. As before, she plays forward the layers of narrating on the rim of the role-play frame, positioning participants in-frame with second-person identifications with salmonberry and developing I-STEAM themes that regulate how the playworld action unfolds. Furthermore, she continues to discursively chain her prompt to the ongoing interactive substrate and she continues to utilize the sun/shade pivot to hold together out-of-frame interactive decisions and in-frame narrative and embodied developments.

Socially distributing RA during these activity launches helped to develop contingent relationality while also loading the interactive substrate proposed for mutual orientation of co-

operative and joint action. The tri-layer framing of the phatic connection was made visible again when it was apropos of RAs integrating emerging action into the broader trajectories of a given activity. In the next example, MB asks the group to reflect on what they would be before being young cedars. She has just shifted from speaking to the group as “you” to “we” after the group embodied being cedars at her prompting. She responds to Zale’s contribution by layering a more embodied enactment (getting “tighter” with their bodies) aligned with LARP goals, while also layering more precise language aligned to I-STEAM goals (revoicing “seed” as “little cone seed”).

- 37 MB: **(.) but what happens before we're even a young cedar tree? (..)**
- 38 **[What are we?**
- 39 Zale: **[a little [((pinches the pads of her right index finger and thumb))**
- 40 **[seed.**
- 41 MB: **We're a little [((mirrors Zale's pinching gesture))**
- 42 **[a little cone seed, right?**
- 43 **[So can we get #e:ven tighter#? (.) #so: tight# (.) be a little seed?**
- 44 **[((starts to lean forward and curl herself into a fetal ball)**
- 45 Multiple: **((Most youth begins curling into fetal balls))**

MB’s framing of the RP transforms the positionality of the group vis-à-vis playworld frame, as MB shifts from previously addressing the group as “you” standing apart from “a young cedar” to “we” signaling in-frame standing and alignment with cedar identity (line 37). Chaining to previous embodied expressions of a young cedar tree, MB prompts reflection on what they were before then, transforming their embodied RR into a RO for RA via the reflective framing of “what happens before.” MB’s transformative RP demonstrates how embodied RRs can be transformed into ROs for further RA.

As she repeats her question, enhancing the interactive sense of its importance and candidacy as a prompt to reflect and respond (Barron, 2000), Zale responds multi-modally, simultaneously in utterance and body. Zale's response (lines 39-40) mirrors all three layers of MB's framing actions: (1) She embodies the response by pinching her fingers, positioning her body and the group's body on the rim of the playworld-frame looking at the imagined seed between her pinched fingers; (2) says "a little seed" participating in the discursive mediation of the narrative stance toward being a cedar seed; and (3) helps develop the pedagogical substrate oriented toward I-STEAM learning objectives by proposing that cedars start out as seeds. This mirroring also reflects and affirms the mutuality of the contingent relatedness between MB and Zale. MB responds by integrating Zale's response into a more elaborated response, further signaling mutual contingent relationality in reusing Zale's language and meaning, to prompt group mediation of the RR with their whole bodies, laminating the in-frame stance in language ("tighter") with its embodied mediation (lines 43-44).

The result is a transformation of participant bodies, laminated with MB's discursive transformation by linking tightness (or, density) to cedar seed, to transform the interactive substrate of the "life of a cedar tree." Interactively, MB's response affirms again how, in this particular activity, RA can be directed toward and mediated by embodied actions and not just discursive objects. Discursively, MB ratifies and chains onto Zale's RR, and MB layers on an embodied shift that reflects a different expression of how a human body reflects a cedar seed (with whole body and not just pinching fingers). The effect of the embodiment transformation is to align the body's stance with the discursive pronoun use, helping players to multi-modally enter the playworld. Furthermore, through the chaining of RA, the participants' embodied RRs of being a seed becomes a RO that is further transformed by RA into a "little cone seed" which is

laminated with in-frame play prompt to embody the action of growing tighter, which aligns in-frame play-action to out-of-frame cognizing of seed density (though the explicit link to density remains a pre-reflective/potential object in the interaction).

How RA is distributed across these turns illustrates how RA functions in this activity on multiple layers: (1) it maintains the contingent relatedness of the interactants; (2) its structure enables socially distributed and multi-modal participation in play-and-reflection; (3) it develops pre-reflective actions with the potential to become ROs through subsequent RA; (4) it transforms the activity substrate toward designed and emergent learning outcomes.

More broadly across the data, maintenance of contingent relationality of the phatic connection pervaded all activities (see Appendices A, B, F). Affirming the theoretical conjecture that collective reflection *requires* contingent relatedness, evidence was found linking unsuccessful attempts at collective reflection to absence of mutually contingent responsivity in the interaction—which is to say that if people weren't openly paying attention to what was happening (i.e., signaling contingency), their participation in collective reflections was less, and collective reflections did not expand as far. In the following example, recognizing that he has yet to establish contingent relations to the group, Gabe stops his trajectory, displays contingent responsivity to actions not responsive to his own trajectory, calls for contingency (“eyes and ears”), waits until the other trajectory passes, and then returns to his trajectory.

- 46 **Gabe:** **Alright guys (.) ohwhh (.)**
- 47 **Priya:** **David**
- 48 **Gabe:** **David (.) come on in. (...) Alright guys, I'm gonna talk to you about for the**
- 49 **stuff for a little minute then we're gonna do (.) #a bit of play and pretend**
- 50 **around here. (.) There isn't enough playing going on,**
- 51 **[I think#**

- 52 **(((Ninja leans up and forward, covering mouth)))**
- 53 **Ninja:** **Yeah there isn't.**
- 54 **Gabe:** **exactly that. [we're gonna play some [more.**
- 55 **ND:** **[whoo** **[I got the biggest blackberry.**
- 56 **Gabe:** **After the biggest blackberry gets consumed. So: [...)**
- 57 **Group:** **[(inaudible)**
- 58 **Gabe:** **eyes and ears over here [guys. (...)**
- 59 **UY:** **[blackberry fight!**
- 60 **(((Ninja reaches over two people to his right to Dave))**
- 61 **Dave:** **^hahaa^**
- 62 **Gabe:** **So: (..) I wanted to talk to you a little bit about what you guys did on Monday.**
- 63 **<You guys remember when we got to go play on Monday?>**

Saying “alright guys” as an attentional directive appears to be Gabe’s initial attempt at interactively establishing the contingent relationality of the phatic connection (line 46). He is drawing attention to himself orienting to the group. He then makes an audible non-linguistic grunting noise that sounds like he’s signaling his affect as he settles into the situation he has designed for and is now facilitating (line 46). He calls in David, who is standing away from the circle, an interactive move that appears to affirm Gabe’s concern for signaling contingent relationality to the group (line 48). He then restarts (Schegloff, 1987b) with “alright guys” a second time (line 48), further affirming that he is focused on establishing a connection between himself and the group. On line 56 Gabe contingently responds to a blackberry comment that appears unrelated to his own prior utterance and then makes a call for reciprocal contingent responsivity, for the youth go give him “eyes and ears” (line 58). As Gabe appears to have established an appreciable amount of mutually contingent responsivity with the group, he begins working on developing the phatic connection of playful affect geared toward play activity. To do

so, he begins by cuing up shared memory of prior activities. The amount of interactive work here, with stops, starts, and pauses, all indicate the importance of establishing mutual contingent relationality before proceeding toward mutual orientation to RA directed toward ROs.

Reflective Prompt-Response (RP-RR) Adjacent Pairing

Yellow (RPs; reflective prompts)

Blue (RRs; reflective responses)

In theory, reflective prompts (RPs) laminate (1) a prompt for RA, (2) a RO toward which the RA is directed, and (3) a call for an adjacent pair response (RR). In the LARP data, RP-RR adjacent-pairs were typically distributed across turns of different interactants but could also be mediated intra-turn as auto-RA (see below). Next-turn RRs to RPs signaled that respondents: (1) were listening and attending to prompter; (2) willing to respond interactively by signaling back their contingent responsivity; (3) understood and were willing and able to utilize semiotic fields for RA. Question-formatted turns often signaled the completion of an RP that may have extensively preceded the question. Interactant RRs ratified that a question was interactively treated as such. In an example used earlier, when Gabe is launching the Grandmother Cedar Story and establishing contingent relationality, he completes his turn with a question that appears formatted to signal the end of his turn, ratified by a swift and strong group response.

Gabe: **uhh (.) not everybody apparently**
 [((rubs hands together just to the left of his face))
 [got to hear all uh (.) all of the stories that were:
 to be told <one of them> particularly important
 (.) ^can e—can anybody remember the story about the >Grandmother Cedar^<?

Multiple: **[((about five hands are raised))**
 [^ME:^

The data is robust with evidence that RRs do not need to be spoken. In the following example, MB prompts the group laminate embodied RR onto her RP narrations, and Miguel illustrates how a response could be embodied rather than in speech:

- 64 MB: ^Make your body feel like you're getting water on you.^
- 65 Miguel: ((Miguel shouts non-verbal sounds as he thrusts his upper body up,
66 springing his arms straight above his head))=
- 67 Charlene: =(Charlene laughs and turns to look at Miguel))
- 68 [Oo: you sprou^ted!
- 69 (((Tommy stands up and shouts a vocalic noise as he raises his arms fully
70 extended to his sides))
- 71 MB: (((looks up at Miguel))
- 72 [Ohuh we've got one sprout! Oh:::
- 73 ^are we sprouting up^?
- 74 [(...)]
- 75 (((everyone in the group lifts up their upper bodies in sync with MB who also
76 extends raises her lower arms to extend left to right at shoulder length and
77 lower arms raised upward at ninety degrees, palms facing o-space; everyone
78 except Marvin and David emulates MB's arm extension almost immediately))
- 79 [Do we have our >first limbs<?
- 80 (((MB starts extending arms to her sides and 5 youth and Charlene emulate))

MB prompts embodied reflection of what a cedar body would “feel like” when it gets water (line 64). Miguel responds with what sounds like an affective cry of joy as he springs up from a crouched position (line 65-66). Charlene appears to interactively ratify Miguel’s playful expression by latching her laughter to his action and laminating a narrative rendering of his action (lines 67-68), introducing a new layer to the substrate, sprouting. Miguel’s RR actualizes two participant potentials in this activity: (1) a spontaneous enactment by a participant drives the

narrative (rather than the other way around); (2) the reflective transformation of the substrate (sprouting) emerging from the spontaneous action of a participant rather than from reflective prompting by an adult facilitator. Tommy then appears to emulate Miguel, though with variation, marking a contingent responsivity among young participants standing all the way up and making a different kind of vocalic noise (lines 69-70). MB builds on this spontaneous momentum by orienting to the link between “sprouting” and its iconic action (lines 71-72) and prompting the whole group to join in embodying the sprouting iconic behavior (lines 73-78). Thus, Miguel’s spontaneous embodied RR appeared to activate a participation potential that spread like “wildfire” (Kangasoja & Engeström, 2005).

In other contexts, such as during the LARP Finale, a player stating their plant name was sufficient to prompt RRs. The capacity of interactants to interpret plant naming as RPs was likely borne from the activity structure of the Finale, in which players had been prompted to enact an ecosystem based on the relations they formed with each other during live play. Thus, finding out each other’s identities was a prompt to enact the relation, by activity design, and turns-at-talk seeking identification were pre-invitations to initiate RA. In the following example, McG learns that Miguel is fireweed and prompts RA toward Marvin, who is salmonberry.

McG: **What's that?**

Miguel: **I'm fireweed.**

McG: **You're a fireweed. How's it going, fireweed?**

Miguel: **(inaudible)**

McG: **Ni:ce! Fireweed, do you think [this salmonberry seed needs shelter?**

**(((looks down at Marvin who is huddled on the
ground in seed icon position)))**

Ostensive marking. Ostensive marking, which was laminated onto words indexing ROs for RA, made RA visible and happened during all forms of RA. Ostensive marking occurred in innumerable forms, and examples of the most prevalent are offered here. Both Appendices A and B render these ostensive markings visible in the transcription and analysis of focal episodes. Higher pitch, for example, was often used to mark RPs, as exemplified in MB's RA practices (indicated by ^):

MB: [So can we get #e:ven tighter#? (.) #so: tight# (.) be a little seed?

(((starts to lean forward and curl herself into a fetal ball))

Multiple: ((Most youth begins curling into fetal balls))

MB: ^And what—what happens in order for us as a seed to start growing?^

Some facilitators utilized extensive and well-timed gestures to ostensively mark their RPs, such as Gabe during the Gabe Launch:

Gabe: (((Gabe resumes gesticulatory pattern as in prior turn))

[Why is this important to do for the land and the [water?

(((stops hands then starts))

(.) And and the [plants?

(((stops hands then starts))

(.) Why would doing this kind of [perspective-taking [be important for them?

(((stops hands)) (((starts hands))

Facilitators would also use metapragmatic markers (e.g., “think,” “know”) that either explicitly marked RA on their own utterance or explicitly prompted the group to engage in RA, such as how MB does both here:

MB: And then the sun comes out and we get more rai:n> (.) a:nd I think we::—

^I don't know (.)

(((Pearl, Olive, and Miguel all rise to a standing crouch))

MB: **[what do we think happens if we get more:: sun and more: rain and
more: nutrients from the soil?^
(Tommy, who was standing, crouches down)]**

UY: **You get tall.**

However, rather than use a single ostensive marker, in the fluid practice of RA facilitators often laminated numerous ostensive marks synchronically and diachronically, apparently with functional value for modulating the fluidity and trajectory of the onto-epistemic navigations of the interaction. In the next example, Charlene displays self-interruption, speeding up, and down-keying of tone, signaling a move to layer reflection akin to reflection-in-action to slightly modify the trajectory while keeping it progressing forward. As Charlene narrates and embodies the Grandmother Cedar story, she marks the end of her turn-at-talk by combining self-interruption (“so Grandmother tree—”) with faster speech and an unmarked tone (her tone had been “pretense” before then). Charlene then resumes the story at the slower tempo and marked pretense tones again.

81 Charlene: **So (.) Grandmother tree (.) and Grandson tree**
 82 **[love each other very much.**
 83 **[((places hand over hand, open palms, over her heart))**
 84 **(.) and the Grandmother tree—(.) her job is to >take care< (.) of the Grandson**
 85 **tree (.) and so on a day like [today—**
 86 **[((raises her hands up, shoulder height, facing**
 87 **inward))**
 88 **oh it's so ho:t (.) and the sun is beating [dow:n**
 89 **[((fingertips touch shoulders))**
 90 **(.) and poor little grandson tree #is starting [to wilt#**
 91 **[((drops head forward and arms to**
 92 **her sides))**

play tri-laminates (1) the in-frame playworld of the LARP activity, (2) the actual environment in which the activity unfolds, and (3) the in-frame orientations of I-STEAM. Such pivoting, characteristic of all variants of fantasy or symbolic play (Vygotsky, 1966/2016), appears to be an interactive resource for heightened marking of an ostensive-referential space, facilitating the reflective and epistemic action of a story that is simultaneously anchored to the actual encompassing ecosystem. Positioning herself and Marvin as characters in the story, Charlene's prosody and timing of embodied actions laminate specific words from the story, ostensibly marking them to the group as having added significance meriting reflective attention: grandson (line 81), love (line 82), wilt (line 90), heat (line 96), sun (line 96), Grandmother (line 98), blocks (line 104), shade (lines 111). These ostensive-referential markings tell this part of the story in 8 words, exhibiting their pedagogical value.

Charlene's anacoluthic self-interruption (line 98), followed by a pause, also suggest her own mentalized auto-RA as part of prompting collective RA. Speeding up her speech tempo and inflecting toward a higher-pitched inquisitive tone (line 101-102), Charlene asks a question that tri-laminates (1) a call for an adjacent pair response (RR), (2) a prompt for RA (remembering), and (3) an RO toward which the RA is directed: how Grandmother creates shade for Grandson. The ratifying response from the group laminates several responses. It ratifies Charlene's bid for contingent responsivity between herself and the group, as indicated by her turn-ending RP calling for an adjacent pair RR. It also signals to Charlene that the group understands and is willing and able to utilize their bodies, in addition to their words, to participate. And it ratifies that the group is willing to participate in the story-telling. Charlene responds (lines 105-107, 111-113) to this response by mirroring the RR in both words and embodied action, with the effect of affirming the collective reply, marking Charlene's contingent responsivity to the group's

response, and holding the semiotic value of their response in place for further action (thus, I coded this strip as a CC, see below). In this sense, while not marking this turn for deliberate reflection, it does appear to consolidate it and foreground it as a pre-reflective object, signaling to the group that this point has a greater potential for cuing again in future interactions.

Finally, though a more extensive analysis is beyond the scope of the present study, it appears to reason that there is a correlation between phenomenological features of the ostensive marking and the extent of deliberate reflection (i.e., stepping back) being prompted. In the following example, Charlene's actions illustrate how facilitators combined gesture, pausing, and slowing down to make a highly marked RP to step back and dwell in a reflective stance toward the group's enactment of the Grandmother Cedar Story:

- 114 **Charlene:** **(((stands up and squares to face whole group))**
 115 **[<(.) and so (.)>**
 116 **(((holds hands to her sides at waste, palms facing up and slightly outward))**
 117 **[<^what did we lear:n^ [(.) in that story?>**
 118 **(((Regan holds her hand up))**
 119 **((Charlene points to Regan))**
 120 **Regan:** **(inaudible) I can't figure out how to say it (.) but to take care or like (.) to ^give**
 121 **back^**
 122 **Charlene:** **mm-hmm (affirmative) to reciprocate**
 123 **(.) does anybody else know what reciprocate means? (.) To be reciprocal?**
 124 **(.....)**

Charlene asks a question that displays significant ostensive prompting for stepping back (which Charlene literally does with her body as well) and reflecting on the story they just told (line 114-117). The manner in which she ceases animating both her body and voice signals a shift to the group. More deliberately reflective in its intent to stop action than the numerous RPs

displayed during the storytelling, this call for RA appears to usher in an *activity shift* rendering the generation of the story as phatic in relation to the emergent space for reflecting on what just transpired. Charlene's paralinguistic cues in asking this question are distinct from prior questions, in that it's much slower, broken up by multiple pauses, and uses the modal metapragmatic “^what did we lea:rn^” indicating that learning has happened, that it occurred during the storytelling, and that a time-space was now opening to reflect on that learning. With the content of the story itself (but not necessarily the interactive process of storytelling) as the RO, the RP calls for RA on what was learned.

When Charlene calls on Regan who speaks quietly but sounds knowledgeable, the group remains quiet and attentive (lines 120-121). The interactive pace here is notably different from earlier storytelling: slower, longer turns, longer spaces between turns. The ostensive cuing here is not just itself a palpable modulation of the spatiotemporal rhythm of the activity, but the interactive time-space opened up by it retains a distinctly different rhythmic feel than the phatic storytelling. Regan's response appears to align with an answer that Charlene seeks, as Charlene *revoices* (Forman & Ansell, 2002) it using a single lexical item, “reciprocate,” that appears to be a reflexive chaining (RC) to Regan's prompt for a succinct descriptor, summarizes what Regan has described, and creates a ground for further elaboration (lines 122-124). Indeed, reflexive communications often appear as participants and facilitators begin to chain RAs to current substrates without necessarily prompting social distribution of such RA.

Reflexive Communications (RCs)

Green (RCs; reflexive communications)

Reflexive communications (RCs) are reflective communications reflexively tied, or *chained*, to prior RA, and that add *new* information. Rather than prompting RA, RCs continue

RA. Communications that functioned like RCs but that did not add new information were coded as CCs (see below), which included RCs that were interrupted before they could relay what was new. As seen above (line 122), Charlene reflexively chains to Regan's reflection on the meaning of the Grandmother Cedar story, introducing to the group a cornerstone word for the camp.

Auto-reflective action (Auto-RA). While RCs technically stand alone as the only code for "auto-RA," in which they initiate and respond to their call for RA, I found cases where coding certain actions as auto-RA did a disservice to the interactional work built into the turn design. When an interlocutor appeared to display RA within their own turn as a form of prompt-response dyad, then I coded such apparent auto-RA as RP (yellow) and RR (blue) within a single turn. This RP-RR exception for auto-RA was found when facilitators were modeling to the group how to engage in call-and-response in a given activity.

Charlene exemplified this practice during the Grandmother Cedar story with moves that appear designed to teach the group how to laminate narration and embodiment as the foundational skill for participating in LARP (lines 81-113). As Charlene began to tell the story, she was ostensibly engaged in auto-RA, adding layers upon layers to the narrative of the story without eliciting group participation. Charlene's auto-RA evidenced how reflective and pedagogical layers of meaning can be laminated onto a substrate within a single turn, which is particularly thick given Charlene's knowledge about the substrate. In other words, collective RA does not require actual social distribution of adjacent pair turn-structures, even though such distributions are common means of mediating RA across the broader set of LARP data.

However, a closer look evidences a systematic pattern to her supposed auto-RA: She systematically starts narrating a plot line and then somewhere along the way (often toward the end of the utterance), she begins to enact the narrative with her body (e.g., lines 82-83). It might

be tempting to analyze Charlene's RAs as purely autonomic, not designed to prompt any particular social distribution of RA. However, two considerations strongly suggest otherwise. First, the design of the activity foregrounded teaching the lamination of narrative and embodiment. Second, looking at the whole arc of the activity reveals that students were prompted to respond with their bodies. In short, in starting an utterance with narrative and then laminating toward the end of each plot line, the embodiment of that narration appeared to be reflective of the kind of action desired in response to the narration, and thus pedagogical. Thus, I have coded Charlene's apparent auto-RD as enacting both sides of adjacent-pair call-and-response. Specifically, I code the narration as a RP and the embodiment as a RR. Furthermore, through this process Charlene also modeled what a "chained reflexive communication" (RC) looks like: reflecting on her enactment of the "love" between Grandmother and Grandson, Charlene reflected briefly on the axiological implication of this love, ostensibly marking that GC's job is to ">take care<" of Grandson (lines 84-85). Soon, the students began to appear to perceive and integrate this patterning of RA and join Charlene (and even lead her) in responding with their bodies and even chaining on their own RCs.

Communication Continuers (CCs) and Pre-reflective Objects

Purple (CCs; continuance communications)

By definition, CCs mark contingency to ongoing interaction, often marking contingency to prior RA, and also have an ostensive openness to them. However, they lack a frame for interpreting a new direction of the ostension, either because they have been cut off or because by turn-design they deliberately remain ambiguous or open to continuing RA on the same RO. In the data, intended RPs that were not ratified and adopted, or intended RPs that remained unfinished (whether intended as such or not), nonetheless signaled an intent including and

beyond contingency, and thus I categorized all of these as communication continuers (CCs). In the following example Marvin calls out a blackberry grove, a move that in some contexts was ratified as a prompt to reflect on the attentional directive, but here his prompt is unheeded.

- 125 **Ninja:** **You are no longer a blackberry**
- 126 **Marvin:** **Ok (.) now what am I?**
- 127 **Ninja:** (inaudible)
- 128 **Dale:** **[eel grass**
- 129 **(((Dale throws arms up in air and smiles))**
- 130 **((group laughter))**
- 131 **((Marvin walks with arms held up and steps wide and long))**
- 132 **Dale:** eel grass (inaudible)
- 133 **Marvin:** **#New blackberry# ((in a sing-songy voice)) gro::ve**
- 134 **Ninja:** **Okay we'll be the American Vine. (inaudible) American vine is an evil and**
- 135 **dangerous thing.**
- 136 **Dale:** **eel grass (.) >our only purpose is to be eaten (inaudible)< (.) <(inaudible)>**
- 137 **Ninja:** **((laughs))**

This strip of interaction illustrates that Ninja, older than Marvin, has attempted to redirect Marvin's attention away from blackberries (line 125). It also illustrates that while Ninja and Dale are willing to respond to Marvin's prompts (line 128), when Marvin attempts to redirect attention back to blackberries, his prompt goes unheeded (line 133-137). Thus, Marvin's move (line 133) functions as a continuer of his attention to a particular RO that he privileges but goes unratified by other participants. However, if an interactant responded to their own RP, after appearing to wait for a reply, I coded this as a RP-RR adjacent pair.

At times CCs appeared as incomplete turns that still marked some kind of ostensive intention. In the following example, MB appears to start prompting RA toward the lifespan of cedar when Pearl interrupts her to ask a question that MB then ratifies.

- 138 MB: So ^what do you think^ it was like here <70 years ago>? Or maybe <150>
 139 years ago?
- 140 David: Or billions or thousands of years ago.
- 141 MB: Do we think red cedars were—one red cedar li—tree lives for (.) a billion
 142 years?
- 143 Miguel: mm maybe
- 144 MB: mm I don't think so. I think maybe like 150 years to 200 years is how long
 145 cedars grow. So ^imagine^—
- 146 Pearl: (inaudible) um into a ^300^ (.) years
- 147 MB: mm there are some that grow ridiculously long >you're right< but us:ually
 148 don't=
- 149 Charlene: =(((Charlene extends arms left to right at waist, palms facing upward))
 150 =[[But what happens when they get #really really# old? Do they just sort of (.)
 151 get [((holds both hands facing each other face height imitating being stuck))
 152 [#stuck# there? >Do they stay like that forever? Do they just kind of
 153 freeze?< What happens to them?
 154 ((Charlene starts leaning to her right))=
- 155 Pearl: =[[I think they start
 156 =(((Pearl extends arms left to right, hands waist height, slight bend at
 157 elbows))
 158 ((Pearl slowly leans her whole upper body to her left))

MB appears to be linking substrates of cedar lifespan durations to implications of aging (e.g., size changes) when she responds to questions seeking clarification about cedar age. As she appears to discursively initiate the transition to size with a CC (line 145), Pearl interjects (line 146), prolonging the reflection on age. Charlene builds on MB's CC and resumes the work of prompting orientation toward implications of age (149-154), a move which gets ratified by Pearl (155-158), the same participant who had interjected to prolong the previous substrate orientation.

In short, MB's attempt to initiate RP directed toward implications of age was interactively converted to a CC, whose function was carried forward and ratified across Charlene's and Pearl's subsequent turns.

While not marking *new* ROs for deliberate reflection, many CCs did appear to consolidate particular actions and mark them as a pre-reflective object, signaling that the object had a greater potential for cuing again in future interactions. At times, facilitators (and sometimes students) responded to RRs by mirroring them in words, body, or both, marking contingent responsiveness to the RR, affirming the contribution and value of the RR, and holding the semiotic value of the RR in place for further action. Furthermore, through their mirroring capacity, CCs helped groups articulate webbed relations at a particular pivoting point of a substrate. In the following example, Priya issues CCs illustrating several of these functions, including how CCs continued the RA, mirrored prior responses, and facilitated the webbing action of the RA.

- 159 Alvin: That's the (inaudible) place for me up there
- 160 Priya: Where?
- 161 Alvin: Blackberries like sun
- 162 Priya: Blackberries like sun? (.) How 'bout salmonberries, do salmonberries like
- 163 sun?
- 164 Regan: um [(.) not really
- 165 Jake: [They like shade
- 166 Priya: They like shade? ^Hmm^
- 167 Alvin: I think they like sun so they can grow.
- 168 Priya: ^Sun so they can grow^
- 169 How 'bout (.) can you be: (.) [can you have both?
- 170 Jake: [blackberries are mostly under the shade.
- 171 Priya: Can you have >both sun and shade<?
- 172 Alvin: Mm-hmm (affirmative)

- 173 Jake: yeah
- 174 Priya: Yeah?
- 175 Jake: [you could be like (inaudible)...
- 176 Alvin: [like you can be (.)]
- 177 [((standing in the sunlight, Alvin steps a foot into a tree shadow))
- 178 [like here like my foot's in the shade (.) <but the rest of my body is in the sun>
- 179 [or
- 180 [((Alvin steps both feet into the shade))
- 181 [it's in the shade and some of it in the sun. ((inaudible)
- 182 Priya: [Yeah? [Hmm

Although they do not clearly mark a new direction in RA, Priya's use of CC's were dynamic in how she used them as interaction resources. For example, they served as backchannel continuers, such as how Priya signaled to Alvin to continue reflecting on the webbed relations between blackberry, sun, light, and shade (lines 181-182). Priya utilized CCs to mirror and hold together responses webbing together notions that salmonberries may like both sun and shade (lines 162, 166, 168). By mirroring multiple, apparently disparate RRs, Priya cultivated a space to prompt reflecting on having both sun and shade.

At times CCs appeared as quasi-RPs, as pre-invitation moves (Schegloff, 2007) that set the interactive grounds for formal RPs. Alvin used this interaction resource multiple times to prompt Priya to position him in a reflective position, such as here when he offers to explain why babies cry.

- 183 Priya: So you've seen like a little th-baby, what do babies do?
- 184 Regan: Cry
- 185 Alvin: Cry
- 186 Priya: Yeah, what else?
- 187 Jake: <cry crawl around>

- 188 Priya: **Crawl around—what if they can't even crawl yet?**
- 189 Regan: **They just like [(.) they don't do much.**
- 190 Alvin: **[they just like sit there**
- 191 Regan: **They just like [cry and...**
- 192 Alvin: **[they just like sit there and cry**
- 193 Regan: **be-uh fed=**
- 194 Alvin: **=they just [sit there and cry**
- 195 Priya: **[FED**
- 196 Alvin: **I know why they cry=**
- 197 Priya: **=why?**
- 198 **(((Priya looks over to far right of group where Rose approaches to begin**
- 199 **filming)))**
- 200 Alvin: **[Because they think it's unfair that everybody else older than them can walk**
- 201 **but they can't**
- 202 Priya: **So maybe they get like >frustrated<**
- 203 Jake: **[and jealous**
- 204 Alvin: **[they can't walk but other people can**

As they are discussing babies, and Priya mirrors and marks Regan's reflection on babies being fed (lines 193, 195), Alvin proposes to know why babies cry (line 196). This exchange is noteworthy for how Alvin's utilization of a CC makes visible the power dynamics of the participation framework interactively shaping the emergence of RA. Alvin has an idea of why babies cry and offers a CC positioning Priya to give him the 'floor' to speak to the group. Why does Alvin make a bid rather than simply say what he knows? Alvin is often involved in overlapping talk with the other participants, and this may be a bid to be heard so that he has a clearly marked interactive space to speak without needing to navigate overlapping speech. This particular situation, in which a CC functions to re-organize the participation structure, shapes the

emergence of RA, illustrating another source of variation in how RA appears. Alvin has a reflective thought to share. It is unprompted, and yet he marks it as valuable enough that he ensures he has received joint attention to his speech before sharing it. He is not attempting to distribute production of the reflective thought to other people other than bidding for their attention. He elicits a *transactional* RP from Priya (by which she makes a RP strictly for the progressivity of the conversation), and then he is free to speak uninterrupted. Priya is positioned as the adult leader of the group, and thus has significant interactive power. Her transactional RP signals to all people present that Alvin should have the interactive space to chain his reflection to a common observation shared by all three students (babies cry), instead of pushing forward to her wish to chain onto feeding babies. As a result, he gets a fully uninterrupted turn to share his entire reflection. Thus, collective RA emerges through a move to chain to a micro-cycle initiated by a student participant rather than adult facilitator, which is relatively rare across the data in which adult facilitators lead LARP scaffolding activities.

Micro-cycles

A “micro-cycle” of RA was any strip of interaction oriented toward the same RO. Typical micro-cycles in education contexts consist of PC-RP-RR, or PC-RP-RR-RC, though RPs can also initiate contingent relatedness whilst prompting new RA. Interactively, the constitution of distinct micro-cycles is likely blurring and potentially insignificant. Analytically, however, distinguishing micro-cycles helps analysts to map out how different semiotic-materials are webbed across the continually shifting assembling of the activity. In the following examples, different micro-cycles could have been drawn, depending on which semiotic-materials and ROs the analyst attends to and foregrounds. I offer a few examples of micro-cycles here, although the combinatoric potential renders the possibilities endless.

CC-PC-RP-RR example:

Charlene: **(.) so (.) >very quickly<**
and maybe (.) somebody (.) from my: group (.)
(((looking toward Marvin))
[<^Marvin (.) do you want to help me^?>

Marvin: **Mm-hmm (affirmative)**
((Marvin begins walking toward Charlene))

RP-RR-CC-RR-CC-RC example:

MB: **How do we know: we're getting bigger:? (.) What else is happening to us? (..)**

Miguel: **We start getting the flowers.**

MB: **We get flowers mmm (.)**

UY: **(inaudible) the leaves=**

MB: **=the leaves—you mean the needles? Yeah, we probably do get some of those.**

In the first example, the RO is Marvin helping Charlene, meaning a relatively phatic concern is the object of RA. In the second example, MB reflects on how the player-cedars know they are getting bigger and she receives one RR, mirrors it with a CC, gets another RR, and starts to mirror it before self-interrupting (suggesting mental auto-RA), and then layers on new information, teaching the group that “leaves” on cedars are called needles. While a web is drawn across flowers, leaves, and needles, they are all directed toward the same RO of cedar getting bigger. New micro-cycles are indicated by new ROs. In the next example, Gabe has acted as the wind, blowing against a stand of cedars. While most cedars were strong and remained standing, Marvin spontaneously decided to fall over (marking a new RO, cedars that fall over in windstorms).

Marvin: **You know that I fell o:ver::?**

Charlene: **[#You fell over?#**

MB: **[^You fell over?^**

^You know what you might be then?^

<Maybe you're gonna be a nursery log> and we can start a new one.

MB's reply layers on that Marvin will become a nursery log, introducing a new micro-cycle as the RO has shifted from a tree that falls over in a windstorm to the nursery log that tree becomes with time. However, it is important to express great caution about tight analytic boundaries around micro-cycles, because determining the "reflective object" can be in the 'eye of the analyst.' To explore further the great range of what an analyst might call the RO of RA, I now turn to that question.

Reflective Objects (RO)

In theory, ROs are the aspects of the interactive substrate ostensibly marked for RA during social interaction. The data exhibited a considerable range of what could be taken up as a RO. For example, in addition to affirming what had been observed in prior research (utterances, actions, environmental entities, processes and relationships, ideas and thoughts, feelings, and bodies), data evidenced unexpected substrate perspectives not previously noted in extant literature (with data citation in parenthesis, see Appendix F): prior shared activities (Gabe Launch, Priya, 7.30); situations (Priya, 7.30); axiological stances (Priya, 7.30); a story told over several turns (GC 7.27; GC 7.18); consolidated summaries of prior shared experiences (Joh 7.21); perceptual gestalts (Priya, 7.20); and webs of relationships (Finale 7.22, 7.31).

Chunks of interaction as ROs. Generally speaking, ROs were constructed out of the interactive work, where several turns-at-interaction were oriented toward a particular RO that itself underwent considerable transformation via the RA of interactants. At times, whole strips of interaction were consolidated into a cohered discursive object in a single turn that could serve as a substrate for reflection. One effect was that participants could evaluate the discursive objectification of several turns and ratify, reject, contest, or modify. The data evidences to what

extent chunks of interaction, or even entire activities, could be consolidated through summary statement or deictic reference into concise objects for reflection. For example, facilitators could convert spontaneous phatic connections of participants—such as an alignment chained to prior discourse—into objects for reflection that facilitated transitions into designed learning activities, which displayed how RA functioned not only to set up relays within an activity (through chaining and webbing, explored below) but also across activities. For example, at the end of Grandmother Cedar Story, Gabe begins transitioning to the next activity by making the whole story the object of reflective transformation in the forthcoming activity:

Gabe: **uhm (.)**
(((Gabe joins hands, palms facing each other in front of mouth and points at crowd on the beat of each of his words))
[so (..) now that you all (.) have (.) seen Grandma—Grandmother Cedar (..)
(((Gabe points joined hands at group))
[I'm going to divide y'all up into your groups right now (.)
(((Gabe points joined hands on beat of every word phrase until his next gesture))
[and what you're going to do (..) is you're going to be:: (..) cedar trees (.) you're going to be Grandmother Cedar (.) you're going to be Grandson Cedar (.) you're going to (.) remember (((Gabe holds four fingers up to group))
>ALL FOUR OF THOSE MOVEMENTS<

The consolidating work of this RP, which wraps up the Grandmother Cedar Story activity, directly feeds into the next activity, minutes later, when MB launches MB small group:

MB: **What do we think cedar's: life is like? Let's ima:gine**
(((MB turns face and orients eye to Gabe))
[the life of the cedar [is what I think what you're after, right?
(((Gabe rotates upper torso toward MB, into the O-space, points at her, and steps toward r-space))

Charlene: mm-hmm

MB: ((MB looks across o-space at Charlene))

All right. So did we[: learn a little bit >about the life cycle< of a cedar today^?

(((tilts head slightly to right)))

(((lifts lower arms, holding hands at shoulder length with palms open and facing outward toward Charlene)))

How MB initiates the phaticity and contingency of the small group activity chains onto and carries forward Gabe's prior RP. In short, both within and across related activities, a reflective turn on an entire activity could make that activity into a RO, rendering it relatively phatic in relation to the emerging reflective stance, opening a pathway for further RA.

Cornerstone ROs of I-STEAM LARP. Land, water, and place; webs of relations; and axiologies were all ROs reflecting I-STEAM values that were repeatedly foregrounded throughout camp activities, even if only implicitly (autonomically, or in phatic orientations to launch an activity), though often made explicit through intentional reflections. Webs of relationships were often made visible around affective capacities, such as when Priya webbed together salmonberries, blackberries, and Alvin's desire to "poke people" around the shared affective capacity to poke, or when Charlene distributed both parts of an RP-RR adjacent pair linking Grandmother and Grandson through the affect of love, while also chaining reflection to the axiological implication of such a relationship. Indeed, axiological concerns were a central to I-STEAM LARP. As a case in point, Gabe designed an entire activity (7.29 Gabe Launch, see Appendices B, C) around reflecting on the axiological purposes behind I-STEAM LARP. Throughout the data, interactants made their axiological positions visible through stances, voice, alignment, and modals (Lemke, 1988). Axiological attention to land was so interwoven in the pedagogical ethos of facilitation that it even emerged spontaneously during hikes, such as when

the perception of land and place as shaped by cultural practices became an explicit object of reflection, during Priya, 7.20 (Appendix F), when Ninja reflected on how an object looked to him like a turtle. Across his turns-at-talk he suggested that he did not expect others to perceive the turtle, an interpretation further backed by how he explicitly linked his perception to the beliefs of his tribe. Priya chained Ninja's perceptual lamination of turtles to the semiotic landscape of another Indigenous elder at the camp, affirming not only the role of culture in environmental perception and meaning-making, but specifically the meaningfulness of Indigenous cultural practices as a RO unto itself.

Finding 1b: The Interactive Markings of Laminated Play-and-Reflection

Analytic distinctions in the data between play and reflection were based on what appeared to be interactant distinctions between “pretense” and “reflective” keys. This distinction was exemplified by Charlene, who, as described earlier, appeared to pedagogically utilize a distinction between pretense and reflective tones when leading the group through the telling of the GC Story (see above and see Appendix B, C). When laminating embodiment onto narration, Charlene stayed in her pretense voice, whereas she appeared to cue more intentional reflection by changing her prosody to a non-pretense voice when explicitly asking for collective RA on the substrate of that playworld. While Charlene often did not stop or step back to teach how to laminate embodied role-play actions onto playworld narratives, her embodied and speech actions helped the group adopt the designed participation framework. When Charlene did “step back,” after diving in for a while, her mannerisms and markings changed, her vocal key sounded more distant and removed, and her shift in voice was mirrored in how she stopped gesturing and stepped back from the play space, altering the f-formation alignment. The difference in voice was marked, laminated with particular embodied signifiers, making palpable a distinction

between “pretense” and “reflective” keys and frames. Often, RPs that implicitly (yet palpably) called for “stepping back” were interactively marked by absence of pretense marking in voice and body, whereas the surrounding action was highly marked with pretense affects and prosodic laminations. Charlene’s pedagogy illustrates how deliberately laminating embodiment into designed pedagogical moves afforded unique distributions of RA.

Later in the week, Gabe’s Launch was an entire activity taking up prior activities as the RO of its interactive substrate (See 7.29 Gabe Launch, Appendix B, C). Throughout that activity, Gabe extensively marked deliberate RA to step back and dwell with a particular reflective purpose on the ‘importance’ of doing I-STEAM LARP, what I call an ‘activity in axiological reflection.’ During that whole activity, Gabe sat in a circle with a group and other than Gabe’s intensive gesturing, very little embodied action was exhibited by the group as a whole.

In short, IA appears to reveal an I-STEAM LARP practice involving what may be called a “reflective tone” that signals to interactants a bid to adopt a reflective stance towards the RO of the RP. Importantly, the presence of this tone did not mark the only kind of RP possible. At many points during LARP, the call for embodiment laminations onto narrative prompts was a form of reflection-in-action (Schön, 1983) that was marked differently from prompts to pause action for reflection-on-action (Schön, 1983). This a significant finding here, with potential implications for how analysts and practitioners distinguish between reflection layered into play versus reflection layered onto play, as well as how reflective practitioners generally make such laminations. The interactive emergence and clarification of a distinction between reflection-on-action and reflection-in-action is signaled multi-modally and sequentially by disparate interactive resources: tone of voice, participation structure, emplacement in narrative/ discursive arc, timing of lamination, and so on. At the end of the Third Finding (below), I reflect on how RA was

uniquely display during the LARP finales, whereby prompts to step back were virtually absent, given the design of the finales; and yet IA illustrates how RA, as an expression of continual reflection-in-action, nonetheless was mapped across the finales.

Discussion: RA as an Interactive Resource of Onto-epistemic Action

The first major finding elucidates how the plastic structure of RA afforded considerable variability in its situated use. Across the data, interactants harnessed the contingent-ostensive signaling of pedagogical communication to decompose and interactively distribute its phatic-referential structure toward both autonomic and intentionally reflective ends. Mapping this distribution motivated me to create a five-component coding scheme, which in turn made micro-cycles of RA directed toward the same RO substrate more visible to me. From this coding scheme, I was able to generate preliminary statistical information. Given the narrow focus of this dissertation (one year of a single kind of activity within a much broader camp designed in highly specific ways), I resist over-generalizing statistical tendencies. However, within the activities analyzed, preliminary analysis of frequencies of RA and its components yields some interesting points of observation. In Table 6, I outline frequencies (single instance per number of seconds) for PCs, CCs, combined phatics (PC + CC), RPs, RRs, RCs, combined reflectives (RP + RR + RC), and overall combined RA (phatics + reflectives). For example, I coded the PC rate for GC story as once every 27 seconds.

Table 6

RA Rates

	Group Size	Time (s)	PC rate	CC rate	Phatics rate	adj RP rate	adj RR rate	RC rate	adj refl rate	RA rate
GC Story	20+	376	27	19	11	12	9	18	4	2.9
MB	11	352	21	10	7	10	7	21	3	2.3
Launch	20+	334	21	48	15	21	19	48	8	5.2

Priya	4	343	14	10	6	9	6	21	3	2.0
Hike	3	469	22	34	13	17	13	16	5	3.6

The lowest frequencies are highlighted in yellow and the highest frequencies in green.

Generally speaking, the Gabe Launch exhibited the lowest frequencies of overall RA (some kind of RA every 5.2 seconds) as well as along nearly every component. In contrast, Priya's small group exhibited the highest frequencies of overall RA (some kind of RA every 2.0 seconds) as well as along nearly every component. Remarkably, the Youth Hike exhibited the highest frequency of RC rate. These findings are not entirely surprising. Priya's group was small (one adult and three youth) and thus did not hinge on as many potential distributive moves for turn-taking as with the bigger groups. In other words, the participation structure afforded rapid responses and higher frequencies of RA. Gabe's launch not only involved nearly all the camp participants, but by design was focused on Gabe leading the whole discussion. Thus, Gabe had the task of managing the group to minimize tangents away from his designed talking objectives, while also doing the majority of the talking. Given the structured nature of adult-led activities, often interactions were driven by adult prompting, positioning students to contribute through RRs. The Youth Hike was not structured as such, and it is likely that this structure afforded more informal communications (relative to pedagogical structuring), in which youth often chained thoughts onto each other's turns without as much concern for prompting RA. However, it is still remarkable that given such autonomy, the youth generated significant RC, as they could have veered off the activity design and chosen not to chain reflectively onto each other's turns. The fact that this group was recorded on the fourth day of camp suggests the efficacy in the camp design to cultivate a particular kind of discursive practice among the youth, in which they chain reflective thoughts onto each other's shared thinking to collaboratively build their understanding.

In the next section, Finding Two, I outline the structure of RD chaining and present evidence of how chaining functioned to facilitate learning during I-STEAM LARP activities.

Finding Two: RD Chaining of RA

Theoretical Framework

In this section, I advance evidence supporting the argument that chaining is an onto-epistemic *webbing* mechanism (Noss & Hoyles, 1996) in which semiotic actions are *reused* or *deictically laminated* (Goodwin, 2018) into and onto layers of *turns-at-interaction*. *Webbing*, as used here, refers to how the contexts of learning, both material and ideational, are webbed into *what* is learned through social interactions with tools and context (Noss & Hoyles 1996). *Webbing* is a multi-modal onto-epistemological accomplishment that draws together multiple co-extant and synchronic connections into a web of relations that can assemble together through time, space, idea, or affect. Analytically speaking, in a web, a node is any phenomenon of interest analytically foregrounded from within a web. Linking is the relation/connection of any given node in a web to another node. Chaining is a particular kind of webbing mechanism fit for a linear medium like spoken language production, in which interlocutors can only produce one word at a time. Examples clarifying the distinction between *webbing without chaining* and *webbing through chaining* will be offered below.

Chaining of RA harnesses the signals of pedagogical communications that doubly mark their interactional context by laminating *contingency* and *ostension*, maintaining continuity across an interaction. The double-marking of pedagogical communications renders RA interactively visible and open (malleable) to transformation, including open to *chaining* of RA. Chaining of RA is a doubling double-lamination of layers of pedagogical communications because it marks *contingency to prior RA* in the ongoing interaction and *ostension toward continued RA*, deliberately chaining links in the present to the immediate past, holding past and present together through indexical marking.

Coding Logics for Chaining

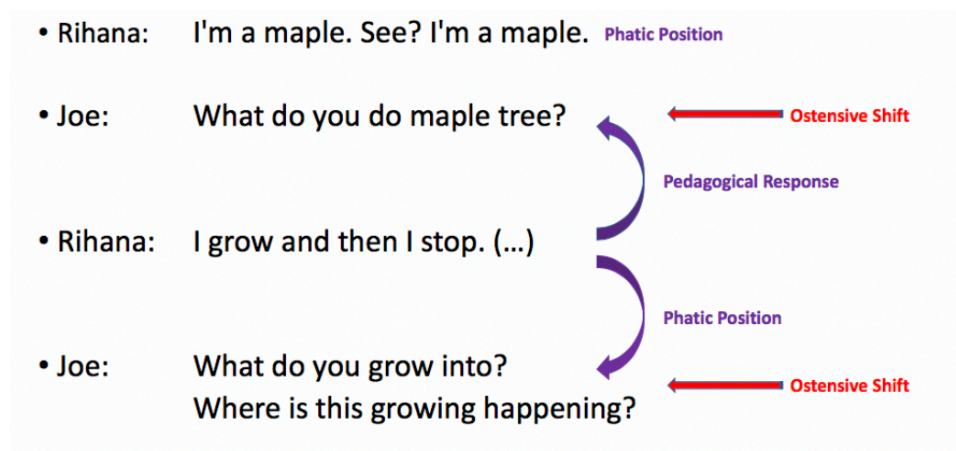
Given the plasticity of how RA gets interactively deployed, the pressing question for this study was how this structure was used as an interactive resource for teaching-and-learning in I-STEAM LARP. To arrive at an answer, I had to distill out the semiotic and onto-epistemic actions mediated by RA. In other words, I had to analyze interactions for what kinds of teaching-and-learning appeared to emerge as activities unfolded. As described in the methods chapter, to map out onto-epistemic learning, I reviewed my video-ethnographic notes, zoomed in on select episodes for transcription and close text analysis, annotated these episodes and marked when a particular density of I-STEAM constructs began to display widespread distribution among facilitators and young participants, and then zoomed in again on 6 episodes for close multi-modal transcription up to and somewhat beyond these ‘points of learning density’ (see Appendix C). The purpose of this dissertation is not to defend how I marked such points, which is why I transcribed somewhat beyond these points (unless I transcribed an entire activity, which I did twice). Rather, the purpose is to explore how interactants onto-epistemically navigated trajectories of activities designed toward particular learning outcomes, and thus I treated the dense appearance of those outcomes as a sign that the activity was ‘arriving’ at its designed learning outcomes. After thickly transcribing the hotspot episodes, I coded the data using the five-component color scheme of RA already outlined, and I studied this for patterns of webbing and chaining. I discovered that what I term *reflective discourse (RD) chaining* was a pivotal resource in building learning density.

In my multi-modal transcriptions of LARP data, I coded and mapped these RD chaining communications in purple (CC) and green (RC), and sometimes yellow (RP), highlighting. CCs and RCs, by definition, continue communications by marking contingency and ostension. As

discussed in the last section, RCs deliberately chain onto prior RA, effecting reflective transformations in what I call auto-RA, because they does not call for ('mark') distributing the reflective process to other interactants, meaning that the call-response adjacent pairing of RP-RR is internally expressed in RCs, if expressed at all. As seen in the example above, CCs assist in chaining onto ongoing RA, and though they appear to play forward the ostensive opening toward RA, they do not introduce a shift or new RO to the RA. While all RPs prompt RA, by definition, some but not all RPs explicitly designate prior action, chaining to it.

Data Analytics: Exemplar Diagram

In *RD chaining*, the *same utterance* is the phatic grounds for RA in relation to a *forthcoming* ostensive shift and pedagogical (informative) in relation to a *foregoing* ostensive shift. Thus, the same utterance can be either phatic or pedagogic depending on where it stands in adjacent relation to ostensive questions. Take the following interaction drawn from my pilot episode of research:



When Rihana says “I’m a maple,” expressing a relatively phatic position, Joe’s response chains a RP to her utterance, taking maple tree as the RO, and prompting for RA on what a maple tree does. Joe’s RP displays contingency by reusing part of Rihana’s utterance (“maple”), and the question-format (marked grammatically by structure and tonally by Joe’s vocalics)

ostensively marks a reflective space for Rihana to respond. Rihana's RR, "I grow..." is pedagogical in relation to Joe's prior-turn ostensive question, reflecting to Joe on what she does as a maple tree does. When Joe chains his next turn to Rihana's RR, asking "What do you grow into?" he now renders Rihana's prior utterance (which had previously been pedagogical) as the phatic grounds for a new pedagogical response. Rihana's same utterance, "I grow," can be either phatic or pedagogic depending on where it stands in adjacent relation to RD chaining moves. In this manner, RD can be chained into micro-cycles of continuous phatic-ostension-pedagogic/phatic-ostension-etc.

Data Analysis

Analytically, I tracked chaining by analyzing turns-at-interaction that doubly laminated contingency and ostension onto ongoing RA ('doubling doubles'), carrying the action of prior RA forward. Chaining actions vary in the amount of additional work they do in how they carry forward prior turns, depending on how they mark contingency and ostension. Some chaining moves were minimal in their linguistic framing, whereas others did considerable intra-turn RA through talk. In the following example, Priya executes chaining across multiple turns in this short strip of interaction:

- 205 Priya: But Regan you said that they also get fed a lot too.
- 206 [((turns to Rose))
- 207 [Babies—you've had a baby, babies eat >a lot<. Babies need—<what do we
- 208 get> from our food?
- 209 Regan: um:: (.)
- 210 Alvin: >milk<=
- 211 Jake: =protein
- 212 Priya: <yeah we get milk>, we get protei:n
- 213 Regan: Carbs^

214 Priya: Carbs, we get lots of good energy, right? We need all this energy. So if I'm
 215 like a little >baby salmonberry< I need (.) a lot of energy, right^? Lots of
 216 energy

Priya decomposes Regan's contribution that babies get fed (line 193) and reuses it in two variant forms (lines 205-208). Priya appears to begin to develop this into an affective relation before self-interrupting (a visible marker of inaudible-mental RA), to ask what "we get" from "our food" (line 208). Given the contextual framing, there's some ambiguity built into this wording that affords a complex layering of multiple frames (Eisenberg, 1984). "We" can mean 'we as babies,' 'we as us people right here,' 'we in our salmonberry characters.' This ambiguity allows "we" to take on any and all these meanings. This RP is ratified with three RRs (lines 210-213). Each RR signals both contingent responsiveness to the RP (by virtue of their relevance) and ostensive-referential marking of the potential trajectory each affords (e.g., Alvin utters "milk" quickly, Regan uses a rising tone to mark "carbs"). The RRs from all three students affirm that Priya is navigating this complex interactive substrate while retaining contingent relationality with all participants. Priya issues CCs that signal contingency to these RRs and continues with a RC that builds on this contingency by revoicing the RRs as "good energy" (line 214). Priya's RC is pedagogical, with an attuned audience, in part by virtue of her ability to utilize chains of RD to elicit participation from everyone and index everyone in the functionally ambiguous uses of "we" to hold together several layers at once. Through her conjunction of CCs and RC, Priya carries forward the participant RRs, which in turn carries forward their contingent and ostensive relations to her original RP. Priya's turns signal double-doubling lamination, both contingently responsive to prior and ongoing RA while chaining ostensive-referential communications to prior ostensive-referential communications that are carried forward through a relay of contingent responsiveness across several turns. In saying "we need all this energy" (line 214) Priya makes

available for RA several links: we as humans, human babies, and salmonberry seeds *all need energy*. In short, an affective relation linking human to more-than-human need for energy holds the group together not only in relation to each other, but also in the playworld frame (introducing a key element in the playworld) and in the axiological and onto-epistemological framing of I-STEAM.

The distinction between webbing without chaining and webbing through chaining is clearly marked in the data. In the following example, MB utilized RPs, CCs, and RCs to facilitate chaining new RA to ongoing RA.

- 217 MB: **^And what—what happens in order for us as a seed to start growing?^**
- 218 Pearl: **Wa-ter**
- 219 MB: **Wa-ter:!(.) ^What else?^**
- 220 UY: **f[ood?**
- 221 David: **[su:n**
- 222 MB: **So let's breathe in ^what do we think our seed**
- 223 **[feels like^?**
- 224 **[((Miguel drops into fetal ball matching all youth except David and Charlene))**
- 225 **((Charlene glances over at David))**
- 226 **What a—<#we're a cedar seed# ^What does it feel like when we start getting**
- 227 **water?^> [>What happens?< (.]**

MB asks the group what they, as cedar seeds, need to start growing (line 217). The group webs three responses: water, food, sun (lines 218-221). MB chains a CC to water (line 219), increasing the chance it will be taken up again, which it is (Figure 4). MB's more elaborate RP involves an explicit move toward "stepping back" from the web of relations they had just "dived into," and then chains back into water, asking for RA around the feeling of getting water as a

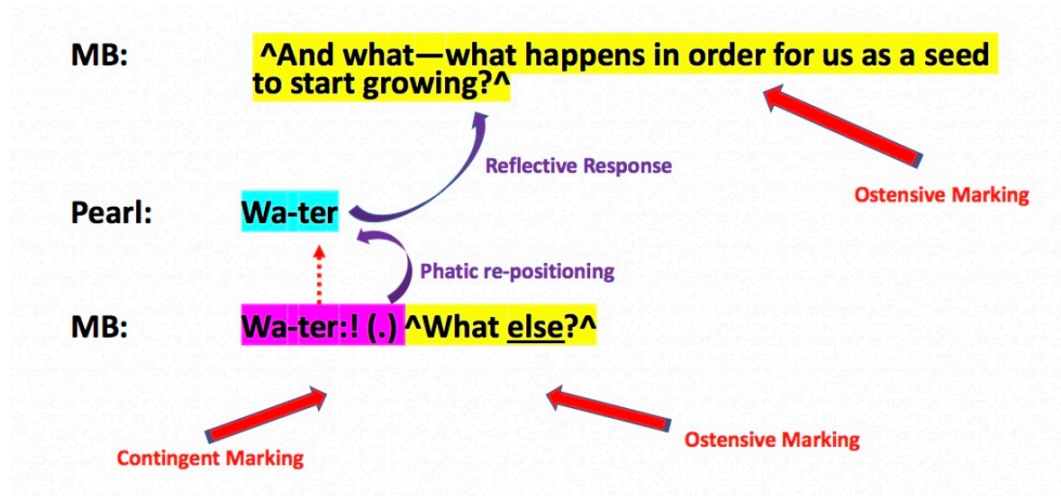


Figure 4. Chaining through communication continuers

cedar seed (lines 226-227). Webbing without chaining can produce an array of potential trajectories for RA, and webbing through chaining initiates action along one of those trajectories.

In the next strip of interaction from the same episode, MB formulates her RP by reusing language from ongoing action, altering only a pronoun from “you” (line 229) to “we” (line 237) while reframing a prior utterance in the form of a question. MB’s chained CC, directed toward Miguel (Tommy appears to emulate Miguel, but MB does not appear to orient to Tommy) expands orientation from one participant to all participants (lines 236-239). MB continues the chaining action by prompting whole group action, transforming an action that had momentarily appeared spontaneous and unique into a sign of forthcoming collective action. While not reflected upon here, and thus remaining a pre-reflective object, this shift from attending to single action as unique to attending to single actions as indicators of collective actions aligns with the broader axiological orientation toward collectivity that characterizes I-STEAM. Thus, while the chaining moves here appear minimal, they appear to layer on considerable work.

228 UY: [(.) (inaudible)]

229 MB: ^Make your body feel like you're getting water on you.^

230 Miguel: ((Miguel shouts non-verbal sounds as he thrusts his upper body up,
 231 springing his arms straight above his head))=
 232 Charlene: ((Charlene laughs and turns to look at Miguel))
 233 [Oo: you sprou^ted!
 234 (((Tommy stands up and shouts a vocalic noise as he raises his arms fully
 235 extended to his sides))
 236 MB: (((looks up at Miguel))
 237 [Ohuh we've got one sprout! Oh::
 238 ^are we sprouting up^?
 239 [(...)
 240 (((everyone in the group lifts up their upper bodies in sync with MB who also
 241 extends raises her lower arms to extend left to right at shoulder length and
 242 lower arms raised upward at ninety degrees, palms facing o-space; everyone
 243 except Marvin and David emulates MB's arm extension almost immediately))
 244 [Do we have our >first limbs<?
 245 (((MB starts extending arms to her sides and 5 youth and Charlene
 246 emulate))

Across multiple turns during this episode, MB's prompts make explicit an implication in attending to the seedling of a cedar tree, that the seed somehow grows into the cedar trees they learned about in the GC Story, and thus her moves implicitly turn to the relational webs necessary for that growth. While the interaction does not always make such webbing explicit, the broader interactions of this activity—as well as the broader goals of I-STEAM and the relational foundation of the GC story which provided the substrate from which the current activity launched—clarify that such a web is indeed the designed trajectory orienting MB's RP. The expansive webbing of the substrate of the life of the cedar, via chaining onto its earliest stages and reflecting on how it grows across its life cycle, becomes clearer as participants collectively

start naming eco-relations of cedar. Indeed, the participant RRs of “water,” “food,” and “sun” (lines 218-221) are all webbed relations to plant relatives that participants have been repeatedly learning at camp. In short, to a certain extent, the activity thus far has largely consisted of cuing up a webbed substrate familiar to many of the participants to prepare the substrate for new action (which will be to experiment with it via LARP as the students integrate more and more of the micro-practices of LARP). Thus, on both micro- and macro-cyclical scales, a process of chaining is at work, in which a transformation of the substrate becomes the object of a subsequent transformation.

It is noteworthy that had participants not spontaneously contributed sprouting actions (lines 230-246), MB may have instead webbed over to prompting sprouting, given that webbing moves do not require discursive chaining. However, chaining this movement to the endogenous actions of the young participants appeared to have significant power in garnering collective response (indeed, this is the only time in the whole activity that everyone acts in conjunction). It is not clear if such a collective response would have been the same if, rather than chaining onto youth actions, MB would have initiated the movement to sprouting by webbing the relations herself. However, the shift to youth-driven momentum of action made the next development especially intriguing, in which David chained to the question of what cedar needs to grow, reorienting group attention to cedar needs and eco-relations.

- 247 David: We need nutrients.
- 248 MB: We need [nutrients!=
- 249 Charlene: [nutrients!
- 250 MB: ^How do we get NU^trients?^
- 251 David: From the soil.
- 252 MB: From the SOil!

of further action. MB chains onto David's RR as the RO for further RA (line 250). David's RR (line 251) to this RP is again chained into the next RP (line 252-253), in which MB asks for further RA on what plants need to grow to get nutrients in the soil. MB's framing of this RP, in which she links plants growing something to get what they need in the soil, exhibits how the framing of prompts can layer on additional RA that is in itself pedagogical. Furthermore, MB's ostensive marking of "nee:d" affirms the importance of how often that word is getting repeated in this activity, chaining what *motivates* cedar to the eco-relations it forms. Again, David reflectively responds and again MB chains onto his answer (lines 254). MB then reflexively chains embodied actions onto this discursive frame to reflectively re-mediate her words, linking plant roots to her toes, which Charlene affirms with a mirroring response (lines 255-260).

At this point, several webbed relations of the substrate are surfacing across the activity: cedar tree life cycles begin as little, tight pine cone seeds in the ground and then sprout up with sun, water, and food, developing roots that can draw nutrients from the surrounding soil. Already, the layers add on to what was learned in the GC story, oriented toward the nested substrates of cedar tree, cedar tree life, and cedar tree life cycle. Furthermore, the speed with which youth embody responses to RPs suggests that the group is integrating the unique participation structure of this activity: a cycle of narrative prompting, embodied enactments, reflective discussions, and more embodied responses setting up further narration or RA on the substrate as it has been developed. Thus, through social distribution of RA, laminated multi-modally through body and discourse, playworld and I-STEAM reflections, the activity substrate of learning about the life of a cedar is continually expanded.

All of this interactive work prepares the interactive grounds for new potential trajectories.

In the next macro-cycle of this same activity, MB is now interactively positioned to introduce novel constructs webbing together cedar trees, winter (seasons), and cedar sap.

- 261 MB: (.) And then: what starts happening?
- 262 Miguel: We get bigger.
- 263 MB: We start to get bigger? K.: How do we know: we're getting bigger:? (.) What
264 else is happening to us? (..)
- 265 Miguel: We start getting the flowers.
- 266 MB: We get flowers mmm (.)
- 267 UY: (inaudible) the leaves=
- 268 MB: =the leaves—you mean the needles? Yeah, we probably do get some of
269 those.
- 270 You know what though? I also think maybe we go through a winter (.) and
271 may:be we go through a summer:. There's a bunch of them probably so (.) I
272 bet it's ((shakes arms))
- 273 [cold sometimes. *Think cedar trees feel cold?* (.) Think we can
274 #tell#? ^What do you think happens^ when it's cold out inside?
- 275 Zale: ((Zale extends her right arm, hand, and fingers fully to her right))
276 [They get frozen.
- 277 MB: They get frozen? Maybe, but they probably get cold, huh? Yeah, all: of the
278 —do you guys know that we have blood inside of us and water inside of us?
- 279 Multiple: Yes, yes
- 280 MB: You know that cedars have something called #sap# it's kind of like their
281 blood? But they have wa:ter, (.) and when it's rea:lly cold out (.) <it doesn't
282 move so fast> so they grow <slow::er:> >in the winter time.
- 283 And then the sun comes out and we get more rai:n< (.) a:nd I think we::—
284 ^I don't know, [what do we think happens if we get more:: sun and more: rain
285 and more: nutrients from the soil?^

explicit an epistemic modality (“I don’t know”) that precedes an invitation (RP) to collectively engage RD (“what do we think...”) about the consequences (“what...happens?”) of what is happening in the substrate of a growing cedar enhancing its webbed relations (“more::”) to sun, rain, nutrients, and soil. The move itself is remarkable because in foregrounding the uncertainty of her own epistemic standing, MB is decentering herself from the webbed relations in the substrate, opening an interactive space for the participants to revisit and reflect again *for themselves* on how the webbed relations affect the substrate. This move shifts reflective attention from the various underlying conditions for cedar growth to reflecting on a grown cedar and the process of aging.

The response to this reflection is that “you get tall” (line 288), a response that appears to satisfy MB’s intention to turn to a new macro-cycle, while carrying forward the stance of some youth who continue to stand on the rim of the playworld. MB’s response (line 289) re-uses the RR but with a pronoun positioning that places the respondent back inside the playworld, a position ratified when another youth affectively exclaims “here we go!” (line 295) signaling a reflective stance toward the affective joy a plant might feel as it grows upward.

In the remainder of the activity, through co-operative actions the group layers micro- and macro-cycles of learning through play-and-reflection. Both playful and reflective aspects of the interaction carry forward the activity substrate toward which the interaction is oriented, continually transforming the substrate with laminations of semiotic-material layers mediating the onto-epistemic navigations of the group’s activity system.

Discussion: Webbing and Chaining of RA

An important question for the study of RA is what kinds of actions do RAs perform in learning environments. Analysis of the data suggests that RA *chains* and *webs* semiotic actions

into semiotic fields. Cross-nodal webbing helped facilitators maintain the “progressivity” of interaction trajectories toward particular learning objectives. Furthermore, interactants often webbed multiple RRs to single RPs, affording facilitators numerous potential trajectories to lead the activity.

RA chaining is a webbing mechanism that entails interactively re-positioning a reflective transformation as a phatic substrate in order to layer another reflective transformation onto it. The content of a prior action/substrate (utterance, story, activity, event, encounter, environment, epistemic stance) is carried forward in another RA. Chaining through webbing, and webbing without chaining, often co-occurred due to the multi-modal reality of interactions. Often, speech-mediated chains, in which interactants “decomposed” and “reused” (Goodwin, 2018) prior utterances in subsequent utterances, carried forward selected discursive material for relatively phatic purposes. In *RD chaining*, the same utterances functioned both phatically and reflectively, chaining together multiple RAs. RD chaining worked *mechanically* by taking up prior turns and rendering referential utterances as phatic connections to subsequent references and *functioned interactively* to help build chains of related reflections that added on to the complexity of the phenomena of interest. Importantly, as a malleable resource, chaining expanded learning in *variable* ways, sensitive to cultural inflections (among multiple inflecting forces, such as geography and situational contingencies). Thus, cultural choices inflected how a webbed chain was built up and which substrates it developed. In the final finding, I walk through six semiotic webs and chains generated through RA chaining during I-STEAM LARP.

Finding Three: The Semiotic Action of I-STEAM LARP Through Chains of RA

Theoretical Framing

In the concluding thoughts of the first finding, I had suggested that in the preliminary data analysis mapping of the interactive assembling of RA during I-STEAM LARP that reflective discourse (RD) chaining across micro-cycles was a pivotal resource in building *learning density*. Part of how I tracked learning density was by following shifts in interactant invocations of *membership categories* (Sacks, 1992; Stokoe, 2012). In this section, I build on the first two findings outlining how interactants harness the structure of RA to chain micro- and macro-cycle trajectories. In other words, the analysis of webbing here builds on and extends the findings of the prior two sections, and what the data discussed here must be viewed in relation to prior analysis. For a fuller analysis, see Appendix B. However, before turning to the findings, I clarify “learning density” and “membership category.”

Learning density. I operationalize learning density as a point at which learning is becoming interactively palpable, exhibited either through multiple turns of novel reflective/pedagogical communications by learners, multiple turns of an educator talking ostensibly with a high level of mutual interactive contingency, or some combination of both. Analyzing learning density in empirical data is difficult because it is murky: How many is “multiple” turns? What is a “high level” of mutual contingency? In a sense, learning density is analytically recognized through a sense the analyst gets that learning is becoming interactively palpable. This is much more than saying learning is happening, which matters, because learning is always happening and the selection of a moment to exhibit “learning” immediately biases understanding of learning against all that is does not select. Moments of “interactively palpable learning” are more than moments of learning because they are moments of learning when

interactants are marking the palpability of learning together and thus remarkable enough that an analyst can empirically cite “re-marking” of what is being learned. By playing certain constructs forward, chaining provides a mechanism to build learning density. I track such constructs as instantiations of membership categories.

Membership categories. Pedagogical communications of cultural, referential information include predications about the “world.” These predications directly shape the interaction itself (Leander, 2002a) and provide an inroad to how interactant invocations of culture structure experience. To analyze how interactants invoked and interactively enacted endogenously constructed sociocultural membership categories, I drew on membership categorization analysis (Sacks, 1992; Stokoe, 2012) to map membership categorization devices, membership collections, hearer’s maxims, category-tied predicates, and category-bound activities (Stokoe, 2012). While the phrasing “membership categorization” may sound like an externally deterministic imposition of “categorical” thought on interactant actions, the analytic tool is designed to reveal the opposite: how interactants re-create culture endogenously, re-voicing candidate categories of culture and interactively negotiating them to ratify interactive grounds for category definition. In short, membership categorization analysis affords insight into how culture is played forward, enacted, contested, and changed through social interaction (Sacks, 1992).

Data analysis of interactant chaining of micro-cycles of RA illuminates how interactants generated macro-cycles of RA that transformed and expanded their initial activity substrates through the continual transformation and expansion of membership categories. Through decomposition, re-use, embedding, transformation, and addition, micro-cycles of RD were

interactively layered reciprocally, progressively, and expansively (cf., Salmon, 2016) to form chains of macro-cycles of RA (see Figure 5).

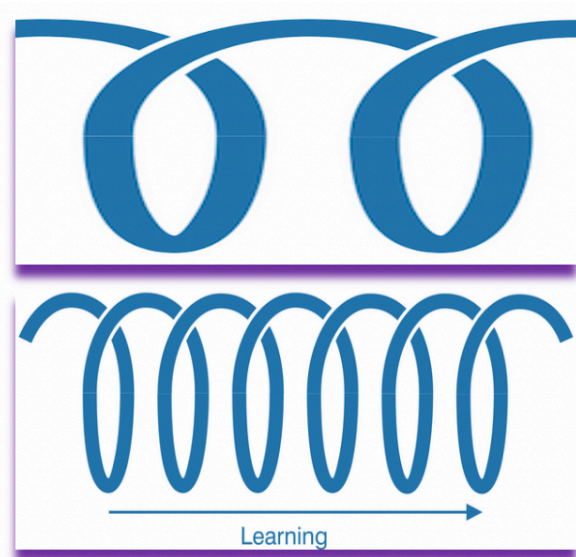


Figure 5. RD is chained through micro- and macro-cycles

The macro-cycles of RA were cycles of continual variation, meaning they had repetitive structural features, and even content repeated at times, but the contexts of manifestation were always shifting, and thus the meanings were continually varying. The shifting contexts of macro-cycles helped ensure that endogenous membership categorization stayed webbed to its interactive invocation. Analysis of the data evidenced how interactants chained macro-cycles onto macro-cycles, increasing the web of relations made explicit and increasing the combinatorial possibilities for further RA on the underlying interactive substrate of the local ecosystem. Data analysis also evidenced how chained macro-cycles appeared highly correlated with widespread group participation and expansion of I-STEAM themed substrates.

Data Analysis: Macro-cycles of Learning

Pilot Analysis of Chaining Micro- and Macro- Cycles

The pilot episode drove the overall aims of this dissertation. The following transcription of several minutes of interaction involving myself, holding the camera and engaging impromptu activity facilitation, and several young participants, does not have RA coding, as this coding scheme was not developed when the pilot was analyzed. However, the transcription does motivate my understanding of how RD chaining affords onto-epistemic navigations (Bang, 2015; Marin & Bang, 2018) and opens up webs of understanding maple tree eco-perspectives.

304 Rihana: I've been walking for MILES and miles (..) [hm-hm^
 305 [(jumps up while raising right hand)
 306 (4s) What are you even doing?
 307 Joe: I-I'm filming.
 308 Rihana: Recording? ((takes a drink from water bottle))
 309 Joe: (8s) I-I'm >filming you become a maple<. Can you can you perform? Can you
 310 show us how what a maple would would do if if you were a maple? (.) #What
 311 would a maple do if it were you?#
 312 Maria: #I would grow into a tall tree.#
 313 Rihana: #I would grow the tallest.#
 314 Maria: [I: would be the strongest of all the trees
 315 [(arms fully outstretched in a wide V))
 316 Jake: (inaudible) ((quasi-imitates Maria's gesture with half raised arms))
 317 [probably Regan
 318 [(looks back and to the left at Regan))
 319 Regan: What?
 320 Maria: ((looking at and pointing to Jake)) You'd be the guy in the background.
 321 Jess: Ha
 322 (4s)

323 Regan: [((points to big leaf maple to the right of path))
324 [Big leaf maple:
325 Joe: Are all of you maples?
326 Maria: [Maple: ((sing-songy))
327 [((jumps up and raises left arm high))
328 Regan: [Maple: ((sing-songy))
329 [((half raises right arm))
330 Rihana: [((raises both hands above head holding water bottle between them for
331 24 seconds))
332 Isabell: [Maple: ((sing-songy))
333 [((quarter raises right arm))
334 Rihana: [Maple: ((sing-songy))
335 Isabell: [Maples over there
336 [((Isabell looks back, to the right, where Regan had been pointing out maples
337 earlier, and points in that direction))
338 Regan: ((to Isabell)) We're another maple.
339 Isabell: uh-huh
340 Jess: We're we're maple babies.
341 Rihana: I'm a maple (.) See? I'm a maple. ((still holding water bottle above head))
342 Joe: #What do you do^ maple tree:?# ((quasi-sing-songy))
343 Regan: We grow=
344 Rihana: =I grow=
345 Jake: =And we grow even more (.) <and then we fall over>
346 Regan: [We grow (.) and we (.) move our branches (.)=
347 Rihana: [and then I s—and I stop. (inaudible)
348 Jake: =and then we die=
349 Regan: =[no
350 [((turning head to face Jake))

- 351 Rihana: [and I just—((shakes head))
- 352 Joe: What do you grow into? Where is this growing happening?
- 353 Regan: [((raises both arms up and outward into a full V))
- 354 [Well we grow up and out so that we get more [sunshine
- 355 Jake: [water
- 356 Regan: like a: like a tree does
- 357 Joe: You grow up and out into the ocean?
- 358 Jake: [Yes:
- 359 Regan: [No [up and out into the sky
- 360 Regan: [((raises right arm upward))
- 361 Joe: What does the sky have that you want?
- 362 Regan: Sun=
- 363 Jake: =sun (.) and water
- 364 Joe: Why do you want the sun? Why do you want the water?
- 365 Jake: Water so we can (inaudible) so we [don't dry out
- 366 [((Rihana drinks from water bottle))
- 367 ((15 second hike logistics talk))
- 368 Rose: So what do you guys think it would be like [to be a bigleaf maple?
- 369 Rihana: [We need water (.) and rain=
- 370 [((Rihana holds water bottle up))
- 371
- 372 ((Regan's response to Rose's question breaks her away from the larger group
- 373 and runs parallel for 11 lines until Regan rejoins the larger group))
- 374 Regan: ((to Rose)) um (..) it'd be (.) har:d (.) hard in the summer because it would be
- 375 hot. And we nee:d a perfect amount and then we'll lose our (.) branches. I
- 376 dunno (.) it might hurt. Um (...)
- 377 Maria: ((eats a potato chip from a bag she's holding)) Potato chips
- 378 Jake: Potato chips?

379 Maria Potato bu:gs
380 Jake: Potato bugs?
381 Rihana: No we nee:d (.) more maple trees, righ:t? (..)
382 Joe: You need them or you are them?
383 Jake: (.) We are: them
384 Rihana: WE MADE 'EM
385 Joe: Oh you made them
386 Rihana: We need more
387 Joe: You made yourselves^
388 Regan: We made what?
389 Joe: You made yourselves into maples.
390 Regan: [Yep
391 [((gives thumbs up with right hand))
392 Jake: With the power of trees
393 Maria: [WITH THE POWER OF OXYGEN
394 [((raises both arms in a wide V)
395 Joe: What's the power of trees?
396 Maria: You [know [(.) nutrients
397 Rihana: [((raises right hand in air))
398 Jess: [Oxygen:!
399 Regan: Oxygen
400 Rihana: THE POWER OF [OXYGEN
401 [((jumps in air with right arm raised))
402 Jake: [Oxygen and nutrients (..) soil
403 Rihana: (..) But we need a lots (.) more trees (..)
404 Joe: As a tree you need more trees (.) Why do you need more trees?
405 Group: hmm-um=
406 Jake: =TO SHARE THE NU[TRIENTS

In analyzing this episode (Appendix E), I distilled five RPs activating pedagogical, referential, semiotic, and onto-epistemic action (Figure 6). These five reflective moves chained together several micro-cycles of RD to form a single macro-cycle unified by a coherent theme emerging across the interaction (maple tree life cycle). Each RP invited co-construction of pedagogical information by all participants.

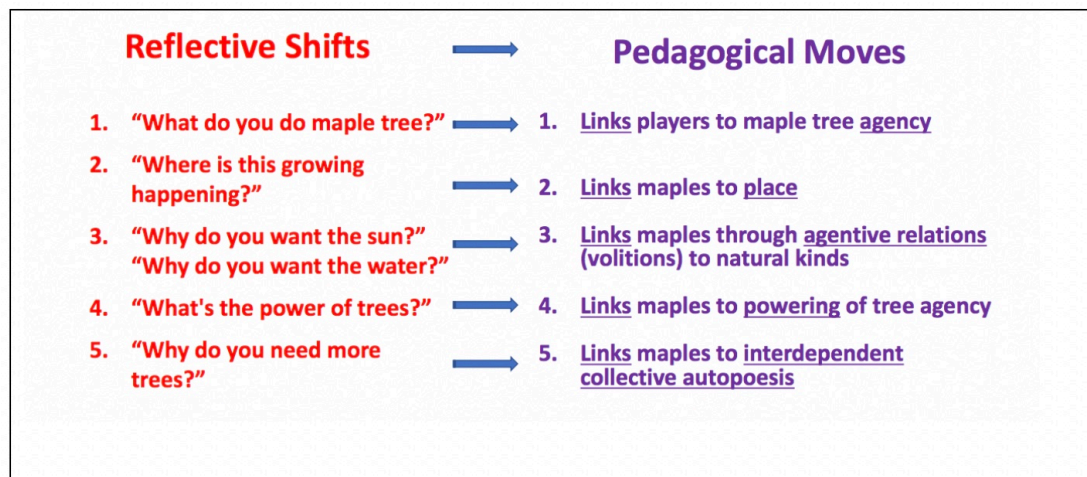


Figure 6. Micro-cycle chaining reflective and pedagogical moves

Collectively, the moves built on prior moves and responses, chaining together playful engagements that phatically sustained the continuity of the interaction necessary to chaining, while continually linking maple-character utterances to learning goals of the activity aligned with goals of I-STEAM through ostensive signals that marked a pedagogical tone to the interaction. Collectively, chaining together the five micro-cycles indexed by the RPs in Figure 6 helped *web* players to maple agency, maple agency to place, maple volition to natural kinds inhabiting the same environment, maple volition to natural kinds that power maples, and maples to each other as necessary to interdependent, collective self-creation.

The macro-cycle of 'cedar tree life cycle' was created by micro-cycles of RD chained together through a *relay* of contingencies extending to the phatic framing that positioned students

as role-players in-frame in a playworld figured by particular participation structures, axiological orientations, and eco-relational mediations. Macro-cycles created by micro-cycles of RD were held together by phatic framing that doubly-placed players in particular participatory orientations to each other *and* the substrate they were reflectively transforming together. The axiological concerns of I-STEAM LARP drove both the content (i.e., reflective framing toward ROs) and interactive process (i.e., participation structure) oriented toward the content. Macro-cycles characterized by stable in-frame participation structures typically reflected (autonomically) I-STEAM LARP axiological stances toward the interactive substrate. These stable formations afforded continuing RA on the macro-cyclical trajectories of their respectively thematized aspects of the I-STEAM LARP substrate.

Chaining macro-cycles in I-STEAM LARP 2015. Having worked out a preliminary understanding of how micro-cycles of RA are chained into macro-cycles, and furthermore what particular interactive resources are relayed across the chains of contingency signaling, I analyzed macro-cycles across all six episodes of data that I had thickly transcribed. I distilled the webs and chains across these episodes to show how webbing and chaining afforded onto-epistemic action during I-STEAM LARP. I mapped out macro-cycles from these webs and chains that illustrated how interactants used chaining to doubly-laminate RAs and semiotic fields onto interactive substrates of I-STEAM LARP. The full analysis of all of these episodes is in Appendix B. A short preview of each episode is provided above (pages 98-100). After reviewing the substrates of webbed and chained macro-cycles across these episodes, I conclude this chapter with a broad discussion of my three-part findings. As I discuss the webbing of each of these episodes, I will refer to statistics summarized in Tables 7 and 8, which give the total and frequency of occurrences, respectively.

Table 7:***Total Number of Coded Chaining Instances***

Activity	Phatic Chaining	I-STEAM Reflective Chaining	Ratio R:P	Longest chain
GC Story	14	50	3.6	UA
MB	4	48	12	38+
Gabe Launch	12	22	1.8	UA
Priya	15	32	2.1	17+
Youth Hike	13	42	3.2	11+

Table 8:***Chain-link Rates (Number Seconds per Instance)***

	chain links rate	Phatic chain rate	Ref chain rate	RC/PC Ratio
GC Story	6	27	8	3.6
MB	7	88	7	12.0
Launch	10	28	15	1.8
Priya	7	23	11	2.1
Hike	9	36	11	3.2

7.27.15 GC story whole group. The webbing together of this activity substrate, in words and embodied actions, can be diagrammed as follows:

- 1) Grandmother linked to grandson via loving and caring relations.
- 2) When it's sunny and hot, Grandma shades grandson.
- 3) When it's windy, Grandma blocks the wind.
- 4) When the deer nibble, Grandma shoos them away.
- 5) When Grandson is lonely, Grandma calls in animals to give him company.
- 6) And with time Grandson grows big and Grandma grows old.
- 7) When it's sunny and hot, grandson shades Grandma.

- 8) When it's windy, Grandson blocks the wind.
- 9) When the deer nibble, Grandson shoos them away.
- 10) When Grandson is lonely, Grandson calls in animals to give him company.
- 11) Reflection: Grandma and grandson reciprocate caring relations.

Overall, the episode was coded for a total of 14 chaining links related to relatively phatic maintenance at a rate of a phatic chaining move every 27 seconds, and 50 chaining moves linking I-STEAM information at a rate of an informative chaining move every 8 seconds (see Tables 7, 8). The entirety of the activity can be mapped to five major chains, or macro-cycles. First, the activity was set in motion through seven phatic chain links. Second, one RD move by Charlene chained the 'loving' relation of Grandmother and Grandson to care, and then Charlene lead the core of the activity by distributing narrating RPs and embodying RRs across adjacent pair RP-RRs. Initially, Charlene modeled these moves, and then she lead the group to enact with her. The story itself had eight chained dyads of RA (Grandson-Grandmother pairing), and each dyad was webbed together without chaining to the prior dyad (e.g., Charlene did not appear to chain wind to sun, for example, though such a connection did emerge as a pre-reflective object that was not taken up during this activity). However, four webbed dyad chains did chain onto Charlene's original formulation linking Grandmother to Grandson via caring and loving relations. Furthermore, each dyad itself was internally chained through RA, whereby Charlene chained to her own utterances. For example, in setting up the hot-shade dyad, Charlene chained five links together. Third, the group reflected on the meaning of the story across four chained RD moves. Finally, across five non-chained webbings, the group reviewed the main actions of the story, and in six non-chained webbings, reflected on the lifespan of trees in relation to humans to consider how vast cedar tree experiences might be.

7.27.15 LARP MB small group. Whereas the interactive telling of the GC story was largely built through chained dyads (i.e., two roles, two actions at a time) and webbing relations across four adverse conditions, chaining of play-and-reflection figured more prominently in MB's small group activity, as they followed the sequencing of a "life of a cedar." Such an onto-epistemic navigation aligned well with the structure of RD chaining. Overall, the episode was coded for a total of 4 chaining links related to relatively phatic maintenance at a rate of a phatic chaining move every 88 seconds, and 48 chaining moves linking I-STEAM information at a rate of an informative chaining move every 7 seconds (see Tables 7, 8). Thus, MB's group chained reflective information at a rate 12 times higher than phatic maintenance (RC/PC ratio), by far the highest of any group. This suggests that MB quickly shifted from relatively phatic positioning to semiotic actions of RA and sustained this tempo throughout the transcribed portion (and indeed it continued beyond what was transcribed). It seems plausible given her expertise as an early childhood educator, as well as her positionality as camp leader, MB was able to tacitly retain the phatic connection while interactively foregrounding the epistemic actions of the activity, summarized across 13 nodes in Figure 3.

This episode also illustrated how horizontal webbing set multiple chains in parallel motion. Specifically, when MB asked what cedar needs to grow, students webbed multiple relations (water, food, sun). MB initially chained to water, going 4 links deep before David chained back to the original RP and webbed to nutrients. This horizontal shift then moved the activity along for 6 chained links. Then, MB webbed a temporal shift that was not explicitly chained to any prior utterance, though conceptually did chain to the substrate of the "life cycle of a cedar." This chain ran 21 links deep into wind blowing strong cedars. At that point, MB initiated a new chain harkening back to the start of the activity as seeds, to reflect on what



Figure 7. Webbing cedar life

happens when the wind blows pine cones down. However, Marvin had simultaneously initiated his own chain and persisted until the group took up his chained move (to the wind blowing) and the group followed his RP seven links deep. Thus, in total, a chain 38 links deep could be mapped across 4 macro-cycles.

Two developments during this episode illustrate the power of chaining to involve a large number of participants that in turn affords onto-epistemic trajectories that might not otherwise emerge. As seen in one of the examples in Finding Two, at one point MB prompted RA on what it would feel like for a cedar seed to get water. Miguel spontaneously jumped up (and Tommy did, too, after this, but did not appear to gain recognition for this right away). MB then chained to Miguel's RR, as discussed above, shifting action from a single person (Miguel sprouting) to everyone. As mentioned earlier, it is noteworthy that had participants not spontaneously contributed sprouting actions, MB may have instead webbed over to prompting sprouting, given that webbing moves do not require discursive chaining. However, chaining this movement to the

endogenous actions of the young participants appeared to have significant power in garnering collective response (indeed, this is the only time in the whole activity that everyone acted in conjunction). Overall, as Figure 3 illustrates, while the discursive content may have been driven by adult contributions, widespread youth embodied participation signaled that embodied cognition of the verbal content and active youth engagement in the webbing action of the activity.

7.29.15 LARP Launch with Gabe. Similar to how Charlene led the GC story, the launch was largely driven by Gabe, who had prepared remarks on helping link the purpose of the LARP activities to what they were learning broadly across the I-STEAM camp. While Gabe did solicit youth participation, their responses tended to be minimal, making it difficult for Gabe to chain onto their responses. This stood in contrast to how Charlene elected Marvin to assist her and how she actively elicited group embodied RRs. Indeed, all of Gabe's moves chained on to ROs that he himself produced. Nonetheless, this episode was coded for a total of 12 chaining links related to relatively phatic maintenance at a rate of a phatic chaining move every 28 seconds, and 22 chaining moves linking I-STEAM information at a rate of an informative chaining move every 15 seconds (see Tables 7, 8). Perhaps largely due to its activity structure, this activity had the lowest frequency of informative reflective chaining moves and the lowest ratio of reflective to phatic chaining moves.

- 1) Play at being cedar
- 2) Learn perspective of cedar, why's that important
- 3) Learn about cedar life cycle, what's important to them
- 4) Human-cedar body problem, difficulty learning about cedar using a human body
- 5) Why learning to take different perspectives is important to land and water and plants

- 6) Linked by vitality
- 7) Don't speak their language
- 8) Thinking like them helps them
- 9) Plant perspective: doesn't want to be stepped on
- 10) Would it want to be cut?
- 11) Giving an offering for cutting
- 12) We don't perceive or understand plants and animals so well
- 13) Putting ourselves in their place helps us

Therese and Priya, two adult facilitators, contributed ROs for reflection as well. However, by including some youth participation, and securing contingent relationality in order to move along the activity (as indicated by the relatively high amount of phatic connecting and maintenance in this activity compared to all others analyzed), Gabe did web together a fluid continuity that elucidated the axiological motivation for why they were doing LARP as part of I-STEAM.

7.30.15 LARP Anchoring with Priya. The small group structure of Priya and three youth, each from a different age group, afforded an optimal engagement of chaining and webbing to develop the interactive substrate. Overall, the episode was coded for a total of 15 chaining links related to relatively phatic maintenance at a rate of a phatic chaining move every 23 seconds, and 32 chaining moves linking I-STEAM information at a rate of an informative chaining move every 11 seconds (see Tables 7, 8):

- 1) Establishing they would explore salmonberry and blackberry.

- 2) Linking salmonberry and blackberry through affective relations involving their share capacities to poke via spikes; needing to balance relations to sun and shade; and needing energy.
- 3) Drawing parallels between human babies and salmonberry and blackberry seeds: mobilities and affective stances, need for food and energy.
- 4) Exploring human/plant parallels, webbing out food sources for babies (protein, milk, carbs), dirt relations of salmonberries (ants, worms, soil, nutrients, other seeds) and sources for growth in plants (roots, water, sun, shade).
- 5) Embodying and reflecting on consequences of plant growth: getting taller, growing leaves.

Through an opening macro-cycle nine chain links deep, the group was able to develop the basic frame of role-playing salmonberry and blackberry, as well as begin reflecting on connections between these two plants. Through a macro-cycle five chain links deep, the group worked out how salmonberries and blackberries balance sun and shade. Through a macro-cycle involving significant webbing (meaning a single RP often generated 3 RRs webbing out multiple aspects of the RO), and two *embedded* macro-cycles, the group worked out several characteristics of human babies. The transcription ended as the group was 17 links deep into a macro-cycle that had started with reflecting on human baby affective needs, before pivoting on their need for food and energy to grow, setting the stage for reflectively enacting their own role-play as salmonberry and blackberry seeds growing and sprouting.

7.30.15 LARP hike. This hike was the only closely analyzed activity with no adult facilitators. Three youth, two friends from the oldest group and one boy from the youngest group, hiked together, tasked with enacting keystone plant relatives during the hike. In a

relatively short span of transcribed interaction they generated more chained RCs than any other group analyzed, including 7 chains that were 3 or more links deep. They had chains of 10 links and 11 links, and a total of 13 links related to phatic maintenance and 42 links engaging RD chaining (see Tables 7, 8). Their chained interactions covered a range of topics:

- 1) Blackberries appear to be destructive and devouring.
- 2) Identifying sword ferns for Marvin.
- 3) Blackberry may be a threat to sword fern.
- 4) Pine tree have relations to people and forest in terms of oxygen and carbon dioxide exchange.
- 5) Nettle and blackberry are forest defenders.
- 6) Clarification of meaning of keystone species for Marvin
- 7) Identification of several keystone members of their ecosystem, including pine tree, maple tree, nettle, and horsetail
- 8) Identifying gifts from pine trees (oxygen), maples (maple and oxygen), stinging nettle (cordage, medicine, forest protection, and food), and horsetail (medicine and food)

The findings here appear contrary with the overall I-STEAM LARP arc in which a perceived elder of a group initiates RA through RPs that distribute single RAs across multiple interactants. In other words, Dale and Ninja, who are older youth peers, rarely appeared to prompt each other to reflect, though they continually engaged RA through RCs that did not appear to be prompts or responses to prompts. However, when talking to Marvin, they were more likely to utilize RPs to engage him, often in the service of pressing him to reflect further on his choice of which plant relative to embody. Marvin, who was much younger than them, appeared to use RPs as an interactive function to bid for their responses. In total, I coded Marvin as

initiating interactively ratified reflection 26 times, Ninja 7 times, and Dale once. Closer analysis shows a variance in how each person used prompts to move the interaction along. For example, while prompt between Ninja and Dale positioned each other to share new information, most of Ninja's RPs directed to Marvin prompted Marvin to think about what plant relative he will be, often clarifying or reiterating rules governing their options.

Across this hike, the negotiation of power appeared much more visible among youth than when adult facilitators were present. This does not mean there were not visible power struggles involving youth and adult facilitators, but rather peer-to-peer interactions among youth appeared to display an openness and normalcy to power negotiations that was less prevalent with adult-to-youth interactions. In other words, adult facilitators such as Priya or Gabe tended to adapt (by either pivoting or using long silent pauses), making contingent responsiveness visible, whereas youth-to-youth interactions plunged forward with much less visible contingent responsiveness. Instead, persistence appeared crucial, as Marvin himself continually bid for ratified participation by adapting his bids to the shifting dynamics of ongoing interaction. Interestingly, a successful part of Marvin's interactional strategy appeared to be when he displayed contingent relationality to Ninja and Dale as experts, such as asking them what sword ferns or keystone species were. In both cases, considerable referential interaction followed, inflecting RA from its autonomic and phatic aspects to its more intentional and referential aspects. Two parallels between Marvin as the youngest member of youth peer group and adult facilitators are striking. First, both Marvin and adults produced, by far, the most RPs for RA. Second, both succeed in balancing the power negotiations of the phatic connection by exhibiting contingent relationality to others in the group, stabilizing the interactive grounds well enough for more substantive referential, intentionally reflective, and pedagogical communications. In short, even while the dynamics distributing and

webbing RA exhibited similar structural aspects between adult-youth and youth-youth interactions (e.g., distributing RP and RR across interactants), the roles and functions were somewhat different for these different participation structures.

7.31.15 LARP Finale. From the LARP 2015 Finale data, I selected 8 episodes each with short story arcs for text transcription, and among those I selected 6 for IA transcription, and I share vignettes of four here. Each episode was selected for how it illustrated chained actions. Here, chaining was much more continuous because of the framing of the activity. The group was tasked with staying in-character (in-frame) continuously. Only when Gabe halted play to announce a new scenario did action stop. However, even these scenarios were chained to prior actions, as they typically involved seasonal shifts.

Due to the complexity of the Finale, in which all camp participants were interacting across a large stretch of land, data collection was very partial. This made analyzing chaining difficult, and thus I was unable to conduct the same kind of analysis I conducted on the other episodes. However, something different emerged from the bricolage of data available: stories that appeared completely born from the simulation. Such storying was built by largely autonomic reflections that reflected how participants grasped the situational complexities of the simulation and responded knowledgeably. While the Finale afforded little room to step back and reflect during play, discussions on the rim of play, as well as narration of actions, continued throughout. Players exhibited reflective awareness of consequences of different actions, often mediated by adult facilitation. The stories that emerged clearly reflected chaining, even if analytically I could not map such chaining, given their continuity across the simulation and the substrates carried forward across multiple interactions, episodes, and game scenarios introduced by Gabe. To give a sense of the unique kind of conjoined reflective and semiotic action of a LARP ecosystem

simulation, I present four episodes in the form of short *vignettes* (Blaise, 2013). For a discussion of the 2015 Finale, including an argument defending the manner in which I analyzed RA across this Finale, see Appendix B.

Episode 1: Summertime sparrows. In this episode, the players role-play the effects of seasonal change to a hot, dry summer. Summer itself is enacted by an adult player, making more visible and salient its role in unfolding action. Several ecosystemic elements are webbed together, linked causally and sequentially to chain reactions set off by Summer's arrival. The camera follows Summer's many interactions: with Rain, demonstrating its desiccant force; with Nurse Log affording protection from the drought; drying up a dead beaver; revealing Bear hiding in a tree that wilts under summer heat; and springing sparrows out who were huddling near Nettle and a plant spore. The sparrows fly off seeking new safety and in their flight they work in parallel with Bear, clarify their relation to Nettle, and make their way to Nurse Log, where a Salmonberry grows from the dried up carcass of a beaver after a heavy rain.

While Summer and the sparrows did not interact for most of this segment, the actions set in motion by Summer's effects directly shaped the environmental affordances available to the sparrows as they set off on their search for safety. Without pre-planning anything other than initial conditions (role-play assignments including characteristic behaviors of the role), the players drew on prior knowledges to enact the seasonal impact of a hot, dry summer and generated several novel interactions and experiences with pedagogical upshots on how actual seasonal changes may affect eco-relations.

Episode 2: Doug Fir. In this episode, a group of four characters hover around Doug Fir, who is growing: two sparrows, Deer, and Baby Salmonberry. The sparrows seek shelter from Eagle who is also in Doug Fir and they find Baby Salmonberry in seed form. Doug Fir welcomes

Deer but asks Deer to abstain from eating Salmonberry because it's so young. Spring arrives, Doug Fir grows taller, Salmonberry sprouts, and the sparrows make eggs. Doug Fir keeps a lookout for predators but then invites Coyote to join the group before realizing it is Coyote (effectively, Doug Fir was tricked). Potentially in response to the coyote frenzy, Mama Sparrow drops her egg which Coyote pounces.

Episode 3: Salmonberry. Salmonberry begins as a seed growing next to two Sword Fern gametophytes (reincarnated from sparrows). When Fire wipes out the gametophytes, Salmonberry endures because it was deep enough underground. Salmonberry is shaded by Doug Fir and begins to grow until Squirrel eats part of it. It survives the eating and begins to produce berries, affording growth in new places and providing protection for Nettle. In turn, as animals (including Coyote) eat Salmonberry, Nettle stings the grazing animals, driving away one, but not Coyote, who is protected by its fur.

Episode 4: Coyote. Coyote starts as a Trickster by pretending to be Deer when encountering a possible horsetail. After eating what may have been horsetail, Coyote meets Bear and Sword Fern huddled together, flees Bear, hides in Alder Tree, who is hosting several other plant and animal relatives, and then builds a den in the roots of Alder Tree. However, Alder Tree falls over after Beaver knocks her over, so Coyote flees again. Coyote meets Fireweed and advises Fireweed to help protect Salmonberry who appears to need shelter. Coyote, who is growing hungry, chases after Beaver. However, another predator tries to warn Coyote off, claiming rights to Beaver. Coyote offers to take turns (is it a trick?) and then Ewok approaches Coyote and offers meat, which Coyote accepts. Coyote then meets Squirrel who runs away as soon as she sees that Coyote is still hungry. Coyote then looks for berries, running into Bear again who chases Coyote off. Coyote continues to roam until encountering some carnage, sniffs

around to discover that it's dead beaver, and tries to eat it but is chased off by Bear yet again. As Winter approaches Coyote seeks and finds a tree to den in.

LARP Finale discussion. LARP finales from both years provided opportunities for players to enact a full-blown Pacific Northwest ecosystem playworld during continuous hour-long play. LARP finales were clearly structured differently than scaffolding exercises. Scaffolding exercises layered narration, play, and reflection while the finales did not have formal breaks in order to reflect. This appeared to affect the kind of reflections that occurred. LARP finales appeared to be more autonomically reflective, presenting the potential for reflective understanding of ecosystemic relations and behaviors, providing opportunities for players to continually embody nonhuman perspectives, affording a MTH perspective of the continual re-assembling of ecosystems over multiple seasons and years. Considerable knowledge was layered through pedagogical communications and autonomic reflection, though not really turned to intentional reflection due to the structure of the finales. In other words, the purpose of the finales was not so much to reflect on substrates (with reflective object potential) as to chain together substrates for the purpose of advancing play. Indeed, for this reason, finale design included debriefs after the finale, both walking back to the main center and in pulling youth aside to discuss. During these finales, while there appeared to be less RD of stepping back and considering what was happening, much of the referential knowledge of pedagogical communications was provided by adults, who commented/narrated as the action continued to unfold, which mirrored how adults often led scaffolding exercises during the week. Nonetheless, sustaining play required some level of cognitive awareness of play frames in motion for players to remain meaningfully engaged in play. Indeed, the numerous layerings of RA to narrate action indicates that players were meaningfully engaged.

In both finales, certain exchanges revealed boundaries in the ecosystem playworld that implicated assumptions about ecosystem boundaries and dynamics more broadly. During 2015 Finale Scaffolding and the 2015 Finale Kal insisted on being Ewok, showing the kind of interactive work youth may do with adults as they advocate for their agentic participation in the joint accomplishment of international RD. Initially, Priya and Alice appeared to sanction his choice to be Ewok. However, as groups mixed, McG countered that he must choose a relative in the relevant ecosystem or leave play altogether. Kal's insistent stance, on both remaining in play and being Ewok, and his agentic defense of a culture and species not otherwise gaining recognition in the enacted ecosystem, ultimately lead him to demonstrate his knowledge of the eco-relations that an Ewok would encounter in their playworld ecosystem. Kal's resistance showed how all interactants involved in this negotiation stood to reflect further on the relations of foreign species (biologically and culture) to the existing native ecosystem. Even the negotiation itself enacted the considerable work foreign relations and native ecosystems must do to integrate with each other in forming a new kind of ecosystem. In short, the emergent experiences both on the rim of play and within the playworld afforded opportunities for continued RA that helped youth-players both display what they had learned during the week and expand youth learning about ecosystem potentials.

Discussion: Pedagogical Communication, Reflective Action, and Chaining

Across all I-STEAM LARP data, evidence was found of reflective action (RA) ranging from autonomic to intentional. Often, in the early phases of an activity, *informative discourses* were set up by ostensive question-posing or cuing, positioning interactants to provide informative references that indexed prior knowledge to help navigate the collective discourse/activity. These linked-turns, or adjacent pairs, comprised autonomic pedagogical

communications. The evidence from the early parts of most activities suggests that often frame-setting involved more phatic discursive chaining than RD chaining. However, even chained discourse that were predominantly autonomic had the effect of creating enough differential tensions in divergent interactant meanings that a space for more intentional reflection emerged, marked by an affective sense of stepping out, collectively, to consider differences, even without clear interactive markings to imply fully embodied stepping out. Thus, although activity-initiating RA often did not appear to signal intentional reflection, activity trajectories revealed how referential knowledge cued by autonomic pedagogical communications were in fact pre-reflective objects (autonomic reflections) available to surface later in the activity as ROs in intentional RA. Such objects could undergo further transformation as they became increasingly refined through RD chaining.

The data evidenced how interactants implicitly or explicitly marked intentional reflection. Implicitly, they used non-verbal ostensive markings such as double-voicing (Bakhtin, 1981) through decomposition and reuse (Goodwin 2018), or they used spatiotemporal modulations such as pauses, changes in prosody tempo, especially slowing down, stuttering, self-interruption, heightened vocalic pitch, or increased use of hedge words. Explicitly, interactants signaled intentional reflection with why, how, and processual-what questions; through metapragmatic modals (Leslie, 1987; Silverstein, 1993) such as *think, wonder, guess, feel*, etc.; and through language conveying speculative thinking (e.g., “could try...”).

The Interactive Power of Chaining

From a temporal standpoint, linking history to the present, holding past and present together, the ‘doubling-double’ of contingency and ostension lend chaining *laminatory* powers to layer together multiple frames for interpreting and shaping experience over innumerable

durations of time. The capacity for webbing to grow with each doubling is expansive. This suggests that pedagogical communications built out of the semiotic resources deployed by other interactants during the ongoing interaction form chains with apparent *double interactive power* via their double laminations of contingency and ostension. Not only do they heighten the sense of mutually contingent relations between interactants, but they also expand the ostensive-referential reflective space of the interaction, making visible the embodied and emplaced interactive webbing of the webs of knowledge co-constructed during the ongoing interaction. Through this mutual visibility in the interaction, chaining appeared to enhance the potential for interactants to act with collective intentionality along mutually inhabited trajectories during their time together and across the activity. As an affect-enhancing interactive move, chaining appeared to increase the power of interactants to interact creatively across a series of chained moves by offering multiple pathways through the combinatorial potential of laminating layers of experience onto their interactive substrate. Increased participation and substrate transformations were mapped across chained macro-cycles during activities.

Chained Macro-cycles

In the I-STEAM LARP data, I found evidence of multiple macro-cycles across each activity, identifying shifts from one macro-cycle to another through analyzing the relations of their respective micro-cycles. Micro-cycles of RA were webbed and chained together to form macro-cycles, which themselves may have been embedded, webbed, and chained into more macro-cycles. The micro-cycles of a given macro-cycle were thematically oriented toward transforming the same underlying substrate. Changing from one macro-cycle to another entailed shifting mutual orientation to an entirely new interactive substrate. Macro-cycles themselves appeared to be dynamic, plastic, and highly variable in duration and extension. Macro-cycles

could overlap or be sequential, continuous or disjointed, chained or not, dropped and then taken up again later. While interactive processes mediated how one macro-cycle was linked to others, these processes were highly variable (connective, disjunctive, interruptive, embedded, etc.). Complexity of discursively mediated thinking was evinced through the *embedding* (Goffman, 1981) of macro-cycles within broader macro-cycles, either as separate but connected macro-cycles or as sub-macro-cycles building up a larger macro-cycle. Each new macro-cycle entailed a substrate shift which itself may have entailed shifts in participation structure, participation statuses, phatic connection, and so on. Onto-epistemic action emerged across these macro-cycles through relays of contingent-ostensive marking of RA that opened up ever-expansive reflective spaces for learning. The particularities of which parts of prior RAs were selected for contingency marking and ostensive orienting appeared to be mediated by a complex assembling of situational exigencies, conscious and unconscious cultural-historical orientations, and conscious intentions—all weak or strong, fleeting or durable—toward particular cultural-historically shaped trajectories of interactive possibilities (such as those shaped by I-STEAM LARP activity designs). Across the data, links between chained discourses, in which actions by an interactant were deictically integrated into subsequent interactant turns, were highly correlated with the expansion of the I-STEAM themed substrate.

Reflection: Cycling Play-and-Reflection

Analysis of the data evidences how interactants during I-STEAM LARP co-created micro- and macro-cycles of play-and-reflection. They used these cycles to build up time-spaces of RA out of situatively created playworlds typically thematized around I-STEAM axiologies and onto-epistemologies, and always shaped by interactant life-histories. Affirming Solomon's (2016) finding that cycles of play-and-reflection appear to “ratchet up” (Tomasello, 1999)—

continually affording expansive possibilities for learning—the findings here suggest that “play” in various forms—word play, interactive play, playful affect, affective play, pretense, and role-play, at a minimum—afforded and constrained emergent opportunities for pedagogical communication and reflective learning, which in turn shaped where play might go next—all evidenced across macro-cycles of interaction.^{viii}

While the data evidences how macro-cycle changes were always interactively constructed and negotiated, nonetheless, evidence suggests that facilitators (typically but not always adults) had significant power in introducing new macro-cycles of play-and-reflection. RA in the data typically appeared in discursive practices directed toward particular interests, most commonly I-STEAM content learning and I-STEAM LARP content learning, though interactive maintenance was a common topic of RD as well. With designs toward specific learning goals in mind, I-STEAM LARP facilitators continually re-cultivated contingent relations in their phatic connections to each other and participants, drew these relations into framing activity launches, and set in motion designs to play in particular ways directed toward designed learning goals. Facilitators balanced between enacting designed trajectories and contingently responding to situational emergence. Facilitator flexibility appeared pivotal to maintaining the balance. This flexibility was exhibited through play-and-reflection in how facilitators integrated ‘pivots for play’ (Vygotsky, 1966/2016) into the frames of play—using bodies, language devices (pronouns and verb constructions), and their immediate environment as key pivots. Facilitator flexibility was also exhibited in how facilitators engaged in RDs that pivoted on foregoing interaction and dialogue to help the group flesh out ideas in webs of understanding and chains of discourse across overlapping macro-cycles of interaction.

Taken together, these interactive affordances of cycling play-and-reflection made it possible for pedagogical interactions to happen at any point during LARP—during launch, during play-frame negotiations, during ‘tangential’ actions during designed activity, and as an activity closed down or after it closed. Pedagogical interactions took up substrates of play and transformed them for deliberate pedagogical intentions. Interactive play, in numerous forms (emergent, spontaneous, discursive, role-played) developed pre-reflective substrates with the potential to be transformed into reflective objects. Thus, as a pedagogical resource, play-and-reflection appeared to be a way of building familiarity with concepts, identities, and phenomena that would later serve as reflective substrates. Some of these phenomena, however, never appeared to be realized in intentional RD that asked participants to ‘step back’ and ‘dwell with’ a RO, meaning that while they surfaced as pre-reflective substrates with the potential to become ROs, such reflective transformations did not appear.²⁴

When able to seize some appreciable interactive power, youth would often do or say something that layered on a new macro-cycle. Youth engaged each other differently, able to draw on cultural logics and referents that were analytically detectable in the data as interactively constructed membership categories (Stokoe, 2012) of youth culture. Through interactive invocation of membership categories, young participants played forward particular cultural-histories in the linguistically visible categories of the interactants. Given how culture receives much of its dynamism through interactive negotiations on cultural meanings, it is noteworthy how often the data evidenced the youth reflectively acting, webbing, and chaining together differently in manner and content than in activities facilitated by adults (see LARP Hike 7.30). This difference created tensions that gave shape to cycles of play-and-reflection. At the same time, when the participation structure of youth afforded distribution of task maintenance, the

collective effect of their laminations of youth-driven playful orientations and I-STEAM content appeared to generate significant chaining around I-STEAM learning goals (see LARP Hike 7.30).

In short, while macro-cycles were heavily inflected by the interests and power of the I-STEAM design and facilitating teams, youth interests both independent of and overlapping with I-STEAM interests inflected macro-cycle trajectories as well. One salient and readily available linguistic-interactive resource for negotiating frame alignment was evidenced in pronoun choices made by interactants while constructing cycles of play-and-reflection. Pronoun shifts signaled movements in and out of play-frames and potentially signaled macro-cycle shifts. For example, first-person pronouns typically marked in-frame stance alignments with a particular character in the playworld, while third person pronouns signaled willingness to participate in the discourse *about* the playworld, but not *with* the playworld. However, macro-cycle shifts were more complex than simple shifts in pronoun stances toward a frame, as evidence was found that pronoun shifts could be used for maintenance of the same macro-cycle, also implying that single macro-cycles held multiple frames. Nonetheless, even when maintaining a macro-cycle, pronoun shifts hinted at their capacity to change macro-cycles. Shifting out-of-frame, such as through pronoun use, often functioned to foreground the importance of a particular connection that was being made during play-and-reflection, to amplify the value given to a particular reflective observation. As these connections accumulated, such as through repeated pronoun stances out of alignment with a dominant pronoun stance, frame negotiation intensified, and ultimately new frames came into play, affording new cycles of play-and-reflection. The subtle laminations of RA with other interactive resources such as language devices promises to be a rich area for

further study, which I will preview in the next chapter as I reflect on the implications of the current study.

Chapter Seven: Responses, Reflections, Contributions, Cautions, and Future Directions

Responses to Research Questions

This study set out to examine two primary research questions. First, I revisit the questions to reflect on what has been learned.

RQ 1: How is reflective action (RA) socially distributed in activities designed for cultivating pedagogical interactions during I-STEAM LARP?

RA is socially distributed as co-operative and joint action. One of the key claims of this study, robustly affirmed by empirical analysis, is that RA was socially distributed as co-operative (Goodwin, 2018) and joint action (Sebanz et al., 2006). The analysis of I-STEAM LARP data explored how RA was socially distributed through interactive marking of *pedagogical communications*, which is to say communications that were *contingently* responsive to actions by other interactants and *ostensively* marked interactive spaces that were reflective, informative, and pedagogical in their intention (Csibra & Gergely, 2009). These interactions drew on powered cultural-histories in their assembling, including how such interactions got framed.

RQ 2: How do interactants harness the capacities of RA to navigate trajectories of socially assembled onto-epistemic webbing of semiotic fields during designed learning activities?

Interactants harness the laminatory powers of chaining to build up semiotic action.

When reflective discourse (RD), as the practice of chaining RA to mediate social discourse, was practiced, interactive phenomena (utterance, story, activity, event, encounter, environment, epistemic stance) were explicitly taken up and “discursively chained” for further thought to “step back” to intentionally reflect. RD chaining appeared to be a pedagogically privileged practice for

how it tracked and mediated onto-epistemic navigations (Bang, 2015; Marin & Bang, 2018) oriented toward textual and/or linguistic learning outcomes. Mapping the chaining actions of RA and RD helped reveal the interactive power of chaining in doubly enhancing participation while building interactive substrates toward I-STEAM learning goals.

Table 9:

Concluding Connections

Implications, Cautions, Future Directions

Methodological Contribution to IA of Pedagogical Interactions	RA Coding Scheme
Analytic Framing of Educational Discourse	IRE/F versus RD
Practical & Design	Contingency, Ostension, Chaining
Future Research	Chaining effects, Distance, Perspective

Reflections on the study of RA

Perhaps unsurprisingly, data analysis has generated more questions than insights into how the situative enactment of RA varies. For example, how do I account for variations in RP formatting? To what extent were these variations due to activity structure, participant cultural-history, participant power, or participant idiosyncrasy? To what extent did play afford phatic framing and connections that sustained a continuous, collaborative discourse that could reflectively expand? To what extent was this expansion made possible by Indigenous discursive practices? To what extent did the interactively negotiated forms of RD reflect onto-epistemic

navigations in and across Indigenous and Western knowledge systems, perhaps a genuine exhibition of a new kind of I-STEAM pedagogy?

As in illustration of the complexity of ascertaining drivers of situational variation, when aiming to revisit the Grandmother Cedar story, which was familiar to many in the group, and with limited time, Charlene initially distributed adjacent pairs of RP-RR to her own laminations of narration-and-embodiment. She proffered two forms of RP, those suggested by how she ostensibly marked her narrations, and those explicitly given when she formatted RPs as questions directed to the group. MB and Priya exhibited similar practices as Charlene, though their approaches utilized more open distributions of adjacent pairing and involved more open questions affording spaces for participant creativity. Rather than reflecting differences among practitioners, however, this likely reflected differences in activity structure, given that MB and Priya were both involved in activities designed to widely distribute turn-taking to their groups. Gabe designed a launch in which his RPs were formatted as questions that interactively played out as relatively rhetorical questions. Joe's RPs were also formatted almost entirely as questions, as he responded to an emerging situation in which he was drawn into pedagogical interactions by youth initiative. When Marvin, Dale, and Ninja went on a LARP Hike, Marvin, the youngest member of the group, proffered the most RPs. Furthermore, the RP structure of that group, as well as the LARP Finale, was more oriented toward harnessing plant identification as a prompt toward RA. With variability as the rule, it is difficult to ascertain rules governing RAs. Similarly, though RD chaining appeared to be a central pedagogical practice across LARP, the intensity or density of chaining appeared to vary situationally.

Throughout these findings, due to the complexity in how RA is interactively assembled during a given activity, the questions of commonality and variability across situation, geography,

and culture were difficult to answer. Indeed, with respect to variability, the key finding here is that extraordinary complexity generates variability. Teasing apart the contributing factors was beyond the scope of this dissertation. Furthermore, it seems impractical, even if researchers and theorists find ways to start unpacking such complexity, that this laborious and cognitively intensive process could be taught to teachers.

Does all this mean that the findings here simply imply that practicing RD is complex and educators should be sensitive to cultural, geographical, and situational variations? Given the largely Western-science bent in both science learning practices (Bang & Marin, 2015; Cajete, 2000; Medin & Bang, 2014), and the practices of the learning sciences (Bang, 2015; Bang & Marin, 2015), the questions posed about variability are pressing and salient in learning environments involving Indigenous youth. Furthermore, not only do these questions advance under-examined grounds in Indigenous science learning, but they advance grounds on how youth and adults, Indigenous and non-Indigenous peoples, may creatively collaborate to construct heterogeneous science practices that are valuable to all communities engaged in science learning, and the science of learning. The best response to all these questions about variability, especially in light of the axiologically pressing need to practice utmost care when working with Indigenous communities, is that the fundamental variability means that cultivating micro-practices of pedagogical communication is particularly needed for increasing contingent responsiveness to the situational emergence of learning, geographic attunement to lands and waters enlivening learning, and cultural sensitivity to power dynamics and participant historicity shaping learning potentials. And toward this end, this dissertation makes methodological, theoretical, and design-practice contributions and guidance elucidating how onto-epistemic navigations in and across Indigenous and Western knowledge systems take shape through situated micro-interactions.

Methodological Contribution: IRE/F and RD

Analysis showed that RA is an interactive resource, and the number of ways in which RA was utilized as an interactive resource are far too many to enumerate here. The point is not to name and count every usage, but to appreciate its extraordinary malleability that affords the kind of variability that makes it so useful for situated action. Critiques of the framework here might point to the pervasive presence of RA. What is not RA? This would be to miss the point of the shift in analytic frame offered by attending to RA. Consider the frame for analyzing traditional classroom discourse, IRE/F (Cazden & Beck, 2003). This frame is widely accepted as sufficient to explain the highly institutionalized practice of formal educational discourse. RD is a different frame predicated on a theory of RA, making the same claim to pervasiveness, but providing a different analytic frame on what the onto-epistemological phenomenon it is that pervades. This frame obviates the question of coding whether or not a particular strip of discourse is reflective or not, instead positing that all discourse is reflective (and is this very different from generalizing formal institutional discourse as some variant of IRF?). Calling all discourse reflective does not undermine the analytic power of RD, but rather shifts attention to what RD foregrounds: variations of reflection that are more or less autonomous or intentional, and more or less distributed across interactants. Rather than worrying over whether the phenomenon is present, such a framework asks how it is present, in what forms, to what uses and ends.

Theoretical Contribution: Reflection-in-Action versus Reflection-on-Action

Theoretically, the work here contributes to discussions around reflection-in-action and reflection-on-action within reflective practices. By foregrounding a phenomenological continuum ranging from autonomic to intentional RA, and mapping the social distribution of this distinction through interactive markings of contingency (as relatively phatic) and ostension (as

relatively informative), I was able to map and diagram (i.e., navigate) the social distribution of RAs from relatively phatic to relatively pedagogical interactions. The analyses of such social distribution produced a finding about differential interactive markings between what appear in theory as two temporally distinct reflective practices: reflection-in-action and reflection-on-action. Reflection-in-action exhibited interactive markings of contingency and ostension, yet the activity-function of such markings often (but not always) appeared more autonomic than deliberate, often functioning to web together single layers of the phatic connection, preparing interactive grounds for subsequent work. Reflection-on-action appeared to be more deliberately marked during interactions. Numerous instances in the data show facilitators discursively prompting the group to “step out” from some activity they had just “dived into.” The ROs of such moves were on different scales than prior ROs. Whereas prior ROs focused on zoomed in aspects of eco-webbing, ROs marked by deliberate prompts to step out and reflect together zoomed out to more meta-reflective spaces to think about collective webbings across learning activities.

At times in various writings about reflective practice, reflection-in-action and reflection-on-action appear to be in conflict with each other, giving rise to dialectical tensions tugging on a reflective practitioner’s affect. The data evidences that these two frames of reflection are also capable of working together creatively through layering processes and not in tension with each other. At times, RA appeared seamlessly laminated across several scales, chained into accumulating, if only temporary, resources for transforming the interactive substrate. In short, the data suggests that in addition to appearing as a binary in oppositional tension, autonomic and intentional also co-exist in other ways, creating a range of possible RAs during situated interactions.

Practical and Design Contributions: Reflecting on Webbing and Chaining

During a collective group reflection during I-STEAM 2018, Dr. Bang, the Principal Investigator of the NSF grant funding the camp, shared with the group that when we are in right relations with land and water, it changes the way we perceive them, and we are able to receive gifts that reveal roles and relations in nature. Having ‘right relations with land and water’ shapes what can be taken up in the accumulative substrate of I-STEAM experiences, which in turn shapes what ‘reflective objects’ are possible for ‘reflective discourse.’ From a design standpoint, the challenge appears to be how to design *practices* that keep potential objects for reflection plastic while maintaining boundaries of discourse and interaction that facilitate ever-expansive collective exploration of I-STEAM substrates. The implication from the data analyzed here is that designers building the camp and training facilitators of the camp should harness the micro-practices of RD to cultivate collective RA that is reflexively oriented toward those same micro-practices. By utilizing the micro-practices to talk about the micro-practices, design teams will be ‘practicing what they preach,’ engaging a mediated praxis (Gutiérrez & Vossoughi, 2010) that harnesses the inherent structure of human communication to model the double-layering of chaining by doing the double-layering of chaining.

This implication for design is indeed an implication for reflective practice in general. By reflexively attending to the double-layering of chaining, facilitator-educators and reflective practitioners alike help each other reflect on how RA helps build collaborative and accumulative thinking. Practices require practice, and thus micro-practices must be practiced, too. The orientation to marking contingency and ostension of RA shifts the frame of practice from a deficit orientation to an orientation to patience for potentials to open up through unfolding activity. This orientation foregrounds contingent responsiveness to cultural, geographic, and

situational emergence. In this regard, there's a kind of continual calibrating of mutual contingency at play in every activity that is ever-shifting the affordances for the chaining effects of RA. Attending to how contingency and ostension are marked and built up helps illuminate paths for collaborative work. Hierarchies between designers and facilitators fade quickly as attunement to webbing and chaining reminds how relays of contingency carry forward histories, helping interactants to remain mindful of how maintaining contingent-phatic relations optimizes ostensive-referential potentials. In short, the practical and design implication is that by attending to how they are marking contingency and ostension, practitioners in I-STEAM and elsewhere align the layers of embodied and speech practices, practicing 'practicing what they're preaching.' Developing and expanding these capacities should help them facilitate ever-expansive cycles of discursive chaining and interactive webbing during learning activities.

Cautions to the Present Research

There are numerous cautions about the research conducted here. First, most the analysis has yet to be member-checked. While I have cautioned earlier against overly-relying on member-checks, at the same time accounting for member perspectives does add to the 'triangulation' of data analysis. Furthermore, my lack of knowledge and experience working with Indigenous communities in the Pacific Northwest, or anywhere, almost certainly led me to misinterpret intent and meaning in any number of places. While I posit that the findings likely indicate how interactants harness contingent-ostensive-referential micro-practices of socially distributed RA to collectively build up knowledge through the webbing action of chaining, it is possible that I have privileged bodies and discourses of human over non-human and more-than-human participants during situated interaction.

Bearing these cautions in mind, I still maintain that the outlines of interactants harnessing basic properties of co-operative action and communication (primary and second intersubjectivities) for RA, and reciprocally harnessing basic properties of contingency and ostension to navigate an activity, are likely valid across any interactive context involving human learning. The purpose of the analyses of this study was not to precisely analyze interactant intention and meaning, but rather to adopt a perspective that attempts to privilege interactant perspective in real-time interaction, utilize tools for rendering this analytically visible, and conduct IA to map if and how interactants engage RA. The argument that interactants do, and do so in ways that harness the properties of RA for chaining together macro-cycles of learning, does appear strongly suggested through the analysis and arguments presented here. However, further analyzing these claims is grounds for future research.

Future Directions for Research

The current study, in particular the countless leads identified in the data analysis (Appendices B, E, F), opens up many potential directions for future research. As just identified, further research should continue to analyze whether and how interactants harness co-operative and intersubjective processes of connecting to establish the grounds for RA, and in turn if interactants utilize the contingent and ostensive-referential micro-practices of RA to laminate macro-cycles of onto-epistemic action onto interactive substrates of learning activities. Future methods should expand to include more member-checking, formative quantitative metrics of RD codes, and greater clarity around the laminatory processes utilized by interactants as interactive resources.

This study created a five-component coding scheme for the social distribution of RA, analyzable at the interactive level. Such a scheme was rather preliminary. However, honing the

scheme through team design and developing it through inter-rater reliability testing could turn it into a reliable tool for conducting qualitative and quantitative analysis of RAs. Indeed, the data analyses in Appendices B and F go far beyond the three major findings, but the space of a single dissertation does not allow for elaboration.

The findings around chaining provide an analytic inroad to revisiting theoretical frames around the concept of “transfer” (cf. Carraher & Schliemann, 2009) in the learning sciences through the analytic lens of IA. Chaining provides an empirical means for tracking and mapping how onto-epistemic concepts and orientations carry forward and relay within and across activities. This may be an inroad to researching how meta-structures (such as culture) come into being through everyday micro-interactions and carried forward across multiple contexts—growing, accruing and transforming. Furthermore, analyzing how interactants identified with nondominant cultural communities utilize chaining and double laminations as tools for onto-epistemic navigation may provide insights into how double consciousness (Du Bois, 1903) is activated, developed, and functions interactively.

Based on some of the preliminary findings in the data analysis, such as how interactants laminated RA with other interactive resources such as linguistic devices like pronouns and verbs to negotiate axiological positions vis-à-vis interaction frames, future research could more systematically begin to analyze how interactants laminate multiple interactive resources with RA as they navigate the onto-epistemic webbing and assembling of situated interactions during designed learning activities. For example, variations in how interlocutors coming from different sociocultural histories expressed their relation to plants through their speech actions may be linked to cultural variations in how perspective-taking is expressed in interactions. Variations in pronouns, articles, and verb constructions all help reveal how speaker speech actions

communicate the distal-proximity of their relation to the objects of their utterances. For example, the inclusion of the indefinite article (“a”) when addressing plants (or players-as-plants) creates distance between the speaker and the object/substrate of the utterance. Conversely, more-than-humans (MTHs) may be interactively attributed personhood as interlocutors close the distance between themselves and the objects of their utterances when communicating with each other. Analyzing linguistic resources utilized by speakers to manage the distance between speakers and objects of their utterances may reveal both cultural variations of different speakers and different chaining trajectories afforded by these cultural variations. Navigating distance may be linked to the chaining effects whose webbing the five-component coding scheme is able to map. Indeed, the complexity of webs may be linked to the extent to which MTHs are attributed personhood.

In providing theoretical and methodological toolkits for the IA of RA during I-STEAM activities, this framework can be integrated into future design iterations of I-STEAM. Specifically, it could be expanded to analyze all activities at I-STEAM, not just LARP. Furthermore, the micro-practices of RA could be formally designed into I-STEAM training activities for facilitators, following the recommendations for how to practice the preaching of chaining reflective discourses.

Concluding Thoughts

The purpose of this dissertation was to contribute to an ethic of *care* (Noddings, 2013) in educational research and pedagogical practices that affords optimal learning, as pedagogical practices that are contingently responsive to situational emergence, geographically attuned to lands and waters, and culturally sensitive to power dynamics and participant historicity. Recognizing the complexity of this intention, I chose a small thread in focusing on the micro-practices of “pedagogical communication” that humans purportedly use everywhere to teach

cultural novitiates about being enculturated human beings. For the purposes of the academy of the learning sciences, I have attempted to walk particular paths through theoretical and methodological frameworks to communicate my findings in languages acceptable to the academy. However, there's another way to communicate my findings. When students, or learners, think that teachers or educators care, they will care what they think. I didn't come up with this pithy paraphrase of my entire dissertation, an Uber driver told me that once when explaining to me his philosophy of education. And yet, it makes perfectly clear what I have tried to convey across 130 some odd pages. The wisdom of how to contingently respond to the communications of another person, such that the other person feels that you are accounting for them in your response, is the key to opening up collaborative spaces where creative thinking appears to abound in diversity and complexity. By carrying forward legacies of care in their pedagogical moves, pedagogues harness the inherent capacities of humans to connect and communicate (and co-operatively act) to learn together.

Appendix A: Transcription Conventions and Coding Schemes

(text)	transcriber notes
((text))	interactant actions
[overlapping actions commences
TEXT	loud
text	soft
<text>	slower speech
>text<	faster speech
(...) or (3s)	pauses
<u>text</u>	stressed speech
#text#	pretense voice
^text^	higher tone
text^	rising tone
.	falling tone
?	rising tone of ratified question
,	slight fall and stop in speech
:	extended sound
=	latched turns
—	interruption
Gray	PCs; phatic connectors
Purple	CCs; continuance communications
Yellow	RP; reflective prompts
Blue	RRs; reflective responses
Green	RCs; reflexive communications

The conventions I developed are inspired by Jeffersonian transcription though I've made some changes to fit the analytic interests of this data. I included markers for "pretense" voice (#) which was a marked voice interlocutors used when voicing in-character stances for their playworlds. Additionally, at times interlocutors used a tone that was higher pitched (^) for whole phrased or utterances that separated that marked speech from surrounding speech. I interpreted these tones as marked a "reflective voice." For both pretense voice and higher pitched voices I marked both the onset and termination of these vocalics.

The color highlighting denotes my coding scheme for reflective action (RA):

- Phatic connectors (PC; e.g., contingent responsivity signaling, mirroring actions, bodily positioning and social formations, frames of social interaction, and so on)

- Continuance communications (CC; Continuers: signal contingency and mark the communication in such a manner that suggests orienting beyond the phatic connection but without clear ostensive prompting for RA)
- Reflective objects (RO; aspects of the substrate foregrounded and marked for RA)
- Reflective prompts (RP; i.e., interactive adjacent-pair communications calling for respondents to reflect on a particular object or substrate)
- Reflective responses (RR; i.e. interactive communications responding to RPs)
- Reflexive communications (RC; i.e., interactive reflections about other interactive reflections)
- Reflective discourse (RD; RA mediated by discourse)

Analytic Notes:

- 1) These codes are relational codes, and not out-of-context absolute determinations. Thus, any code is determined by how it is positioned in relation to the surrounding interactive context. For this reason, the same exact utterance uttered by the same person in two different contexts can be coded differently. For example, a minimal vocalic but nonverbal prompt to reflect may be coded as an RP if it is successful in inducing an RR, or if it leads instead to a more elaborative RP, then it would be coded as a CC.
- 2) Coding whether a stretch of activity is predominantly oriented toward phaticity, contingency, RP, RR, and so on is not perfect and there's certainly room for interpretative variation. I have chosen to interpret closely sequenced identical actions as mirroring actions signaling contingency, rather than referential signals of RA. While these actions do include referential information, reflective attention seems less focused on this and more on signaling interactive responsivity. However, getting this precisely right

is not the point. Rather, displaying how, across the broad interaction, RA is distributed, and how it depends on the contingent relationality of the phatic connection, and how through mirroring responses marking contingent relatedness reflective capacities expand—these are the points supported here. If I have been overly conservative, and what I have coded as contingent responsivity is more than that and actually reflects RA by respondents, this does not take away from the fact that contingency was also displayed and empirically appears to not only co-occur with, but also interactionally initiates and affords, any kind of interactive space in which RA can take place and be distributed.

Appendix B: Interaction Analysis of Six Episodes of I-STEAM LARP

7.27.15 Monday Grandmother Cedar Story Whole Group

In both years, LARP begins by retelling the Grandmother Cedar (GC) story, a Pacific Northwest Indigenous story that foregrounds the cedar tree perspective of its ecosystem, including cedar relations between older (Grandmother) and younger (grandson) cedars. The story foregrounds roles, relations, reciprocity, and gifts across seasons and life cycles between cedars and other cedars as well as their ecosystem. Adults lead the storytelling and in both years student participation was ostensibly elicited by what literature on classroom discourse has characterized as initiate-respond-evaluate sequences (IRE; Mehan, 1979), typically driven by known answer questions (KAQ; Cazden & Mehan, 1989). Responses were both in spoken words and iconic embodiments. Given the explicit intention to develop embodied enactment which linked storytelling, GC story, I-STEAM values, and LARP, the story invocation via KAQ helped to quickly cue the substrate, which many students already knew, and foreground the lamination of embodied enactments of the story. Thus, this activity aligned with the pedagogical objective of introducing the structure of embodied play and narration that characterize I-STEAM LARP.

However, rather than demonstrate how KAQ and IRE may have been situationally functional, I evince evidence supporting a different framing, that of reflective actions (RAs), informed by the theories of reflective discourse (RD) and pedagogical communication (PC). As outlined earlier, in a RD analytic framework, all discourse is treated as minimally reflective (autonomic) with the potential to expand fully to intentional reflection (interactively marked, for example, by metapragmatics). A PC analytic framework is complementary to an RD framework, foregrounding how the contingent relationality of the phatic connection of an interaction is interactively established and maintained, how the interactive substrate emerges from establishing

the phatic connection, and how the substrate gets layered through ostensive markings that open up interactive spaces for referential, pedagogical, and intentionally reflective communications. Taken together, these frameworks help foreground how interactants transform phatic interactions into pedagogical reflections through RA.

This telling of the GC story is led by Charlene, but also co-constructed with participants. In their telling, Grandmother Cedar creates shade with her branches to protect Grandson, blocks the wind from hitting Grandson with her branches, shoos away the deer when they begin to nibble on Grandson, and calls in the squirrels and the birds to be with Grandson when he's lonely. Then he grows and she ages and he cares for her in the same ways. In addition to teaching the story, Charlene's pedagogical moves are designed to help student learn how to laminate embodied enactments onto the narration of the story. Charlene is quite animated throughout the telling, in body movements and positionings, gestures, voices, and tones. Her playfulness cues up group participation, fostering coordinated attention through the co-operative and joint actions of telling the story.

Grandmother Cedar Story

At the start of the activity, Gabe is talking. Gabe occupies a privileged positionality in leading the design and implementation of learning-through-LARP during the I-STEAM camp design iterations of 2015 and 2016. In both years, Gabe implemented designs for preparing youth to become players in a LARP playworld ordered by the discoverable principles guiding the waters, lands, and ecosystems emplacing the camp. Thus, it is plausible that Gabe was interactively positioned as "leader" of the group before he even spoke. Given this power to lead and speak, when he does speak he quickly extends power first to Charlene and then to anyone in the group who can "remember >a story<." These moves trouble his positionality as activity

leader, suggesting that this hierarchy, perhaps of leader and non-leader, can be flattened by those who “remember a story,” suggesting that cultural knowledge (of the relevant story) mediates who is empowered to participate in this activity structure. This move in itself is likely a function of an Indigenous axiological stance toward the relations of knowledge, story, power, and participation (Bang & Medin, 2015; Cajete, 1993; Marin & Bang, 2015). In addition to opening up the activity participation structure to the group, Gabe also introduces the interactive substrate for reflective action (RA), accomplishing several feats in one turn-at-talk.

408 **Gabe:** **(((Gabe clasps hands together into an interlocked fist in front of his**
 409 **mouth and scans the group turning his head repeatedly left to right))**
 410 **[so (..) ((exhale))**
 411 **I'm gonna need (.) Charlene—#actually I'm going to need (.) just about**
 412 **anybody's help who can remember >a story<# (.)**
 413 **((exhale))**
 414 **uhh (.) not everybody apparently**
 415 **(((rubs hands together just to the left of his face))**
 416 **[got to hear all uh (.) all of the stories that were:**
 417 **to be told <one of them> particularly important**
 418 **(.) ^can e—can anybody remember the story about the >Grandmother**
 419 **Cedar^<?**
 420 **Multiple:** **(((about five hands are raised))**
 421 **[^ME:^**

While only two turns-at-talk in, the interaction launching the activity is already interactively rich. I stop the transcript here because it displays basic features of pedagogical communications and collective RA while also introducing the interactive substrate for the cooperative actions of the group activity. The framing leading up to and during Gabe’s activity-launching question along with the wording of this question collectively signals an invitation to

group members to join in a particular kind of co-operative action. As he is establishing contingent relationality, Gabe is also laminating onto these actions his orientation toward the interactive substrate. Gabe's bid appears to direct the mutual orientation of the group toward the interactive substrate (Goodwin, 2018) of telling Grandmother Cedar Story. As he speaks, Gabe appears to have an activity in mind involving the telling of ">a story<". His slowing prosody as he utters "a story" ostensibly marks it for interactive orientation. He has pre-marked what action is to take place—telling a story, and he has marked the participation structure—anyone "who can remember." Thus, Gabe's move doubly laminates the interactive substrate with a discursively visible a link between people who remember the story (attentional orientation) and people who can participate in telling the story (participation framework).

The discursive termination of Gabe's RP marks the end of his conversational turn, and the question itself interactively signals its own termination as an adjacently paired turn calling for response from other interactants. The interactive ratification of Gabe's bid for interactants to participate is signaled by the response to his solicitation: five raised hands and one or more youth shouting "ME!" (signal strongly contingent relationality among several participants in terms of (1) listening and attending to Gabe, (2) willingness to respond to Gabe interactively by signaling back to Gabe their contingent responsivity to him, and (3) their affirmative response to the question of their recollection of the story implying their willingness to participate in its telling. This strong and positive collective response affirms that contingent relationality is interactively vibrant and that a positive phatic connection among several participants is in motion.

Gabe does not prompt RA on this story, nor does he perform any of it, but his pre-marking of it makes clear that it is cued as a pre-reflective object that will receive further RA once the activity begins. The adjacent pairing of question-answer (Schegloff, 2007) employed by

Gabe reveals the basal structure of the analytic object (i.e., “unit of analysis”) of RA: a reflective prompt (RP) paired with a reflective response (RR). A RP is an interactive move ostensibly marked (Gergely, 2007) by its tonality and discourse content that modifies (Duranti, 2009a) and shifts (Cobb et al., 1997) the interaction toward RA (remembering) on a reflective object (RO), the Grandmother Cedar (GC) Story. Gabe’s cue to recall the GC story slows down as he utters “Grandmother Cedar” and “a story”. The slowing down may have the effect of suggesting interactively that time-space is opening up (by virtue of slowing down to enter it) in which recollection of this story is an anchor (/substrate) for what’s to come. Using variants of the verb “remember” in speech is likely a metapragmatic marking (Leslie, 1987) that amplifies the sense of forthcoming RA. Thus, even before uttering his RP, Gabe already discursively signals RA during his turn. Thus, the RP itself is a formal bid for the social distribution of RA of remembering that closes out Gabe’s turn (prompting its adjacent response).

Gabe’s RP receives a RR that ratifies his interactive move toward RA. The response of the youth is minimally reflective, virtually autonomic: raising hands and crying “^ME:^” Yet these same actions bear heavy ostensive marks drawing attention to the active participants eagerly trying to tell/teach Gabe something, i.e., that they remember. This information is pedagogical, because it teaches Gabe (1) who is able and willing to participate and (2) how they are participating right now. Gabe’s whole turn itself is also pedagogical because it teaches the group how the forthcoming activity will start, with remembering GC story. Both his body and words exhibit a prosody that is oriented toward eliciting contingent responsivity and ostensibly orienting the group toward reflective and pedagogical actions on the specified interactive substrate.

In the following chunk, Gabe makes the explicit link to the projected activity of telling the story of GC and displays concern for how quickly the activity must proceed given the amount of time available before passing the lead to Charlene. With her turn, Charlene continues opening the participation framework for telling the GC story to the group by asking Marvin if he will help. Marvin agrees and Charlene positions them as Grandmother and Grandson cedar in the story, respectively.

- 422 **Gabe:** ooh, oh ((inhale)) ok: (.) so: (.)
- 423 we nee:d (.) we need some >storytelling to go on< (.)
- 424 [((raises right wrist and looks at watch))
- 425 [<really quickly> (.) (inaudible) uh:
- 426 [((turns to look at Charlene))
- 427 [Charlene I'll let you lead on it
- 428 **Charlene:** (.) so (.) >very quickly<
- 429 and maybe (.) somebody (.) from my: group (.)
- 430 [((looking toward Marvin))
- 431 [<^Marvin (.) do you want to help me^?>
- 432 **Marvin:** Mm-hmm (affirmative)
- 433 [((Marvin begins walking toward Charlene))
- 434 **Charlene:** you can help be my (.)[my (.) tree (.) ^all righ^t^?
- 435 [((steps to front of group and turns to face it))
- 436 **Marvin:** [((Marvin steps to the front of the group and stands to left side of
- 437 Charlene))
- 438 **Charlene:** [^will you be my <grandson tree> and I'll be the grandmother tree?^
- 439 [((Charlene and Marvin angle their bodies to an open-L arrangement
- 440 facing the group))
- 441 (.)
- 442 So (.) Grandmother tree (.) and Grandson tree

443 [love each other very much.
 444 (((places hand over hand, open palms, over her heart))
 445 (.) and the Grandmother tree—(.) her job is to >take care< (.) of the
 446 Grandson tree
 447 (.) and so on a day like [today—
 448 (((raises her hands up, shoulder height, facing
 449 inward))
 450 oh it's so hot (.) and the sun is beating [dow:n
 451 (((fingertips touch shoulders))
 452
 453 (.) and poor little grandson tree #is starting [to wilt#
 454 (((drops head forward and arms
 455 to her sides))
 456 (.) and he's starting to >fee:l)) [the
 457 (((raises forearms and hands to shoulders,
 458 turned inward))
 459 [heat< and the [sun (.)
 460 [curls fingers [curls fingers
 461 [so Grandmother tree—
 462 (((raises elbows chest height, rotates lower arms toward front of chest,
 463 interlaces fingers))
 464 <^does everybody remember what Grandmother tree does to help create
 465 shade?^>
 466 Multiple: ((Several youth hold up both arms above each other's heads))
 467 UY: she blocks [(inaudible)=
 468 Charlene: (((Charlene extends arms fully forward and slightly upward,
 469 hands
 470 facing down and fingers interlocked, above Marvin's head))

471 Charlene: =[yeah: (.]
 472 [((several youth continue to hold both arms up; and some older youth
 473 hold arms
 474 over heads of younger youth; all of this is done quietly with numerous
 475 smiles))
 476 she [blocks (.) and #creates some sha:de#=
 477 [((fully extends all fingers then sways arms gently left to right over
 478 Marvin's head))
 479 =(Gabe extends arms forward))

How educators initiate LARP activities throughout the camp, and mediate in-frame (i.e., in story or in play) and out-of-frame stances, is evidenced in this chunk. In positioning Marvin's out-of-frame body as a pivot for a tree, the symbolic actions of out-of-frame objects, particularly the bodies of the players, are foregrounded for their capacity to take on symbolic in-frame meanings transformed to fit the storyline. Charlene further affirms this through her own embodied enactment of Grandmother Cedar tree, fitting her iconic enactments of Grandmother to her narration of Grandmother's actions. Charlene also draws a pivotal link between the "perceivable" ecosystem and the "storied" ecosystem as she says, "on a day like today, oh, it's so hot, and the sun is beating down". Thus, the pivoting action of play laminates the in-frame playworld of the LARP activity, the actual environment in which the activity unfolds, and the in-frame orientations of I-STEAM.

Such pivoting, characteristic of all variants of fantasy or symbolic play (Vygotsky, 1966/2016), appears to be an interactive resource for facilitating the reflective and epistemic action of the story. Positioning herself and Marvin as characters in the story, Charlene's prosody and timing of embodied actions laminate specific words from the story, ostensibly marking them to the group as having added significance meriting reflective attention: grandson, love, wilt,

heat, sun, Grandmother, blocks, shade. These saliently marked words alone tell this part of the story in 8 words, exhibiting their pedagogical value.

This chunk also evidences the first macro-cycle of RA on the substrate, and it demonstrates the plastic malleability of RA to fit its situated use. As Charlene begins to tell the story, she is ostensibly engaged in auto-RA, adding layers upon layers to the narrative of the story without eliciting group participation. Charlene's auto-RA evidences how reflective and pedagogical layers of meaning can be laminated onto a substrate (GC story) within a single turn, which is particularly thick given Charlene's knowledge about the substrate. In other words, collective RA does not require actual social distribution of adjacent pair turn-structures, even though such distributions are common means of mediating RA across the broader set of LARP data.

However, a closer look evidences a systematic pattern to her supposed auto-RA: She systematically starts narrating a plot line and then somewhere along the way (often toward the end of the utterance), she begins to enact the narrative with her body. It might be tempting to analyze Charlene's RAs as purely autonomic, not designed to prompt any particular social distribution of RA. However, two considerations strongly suggest otherwise. First, the design of the activity foregrounded teaching the lamination of narrative and embodiment. Second, as will soon become evident, looking at the whole arc of the activity reveals that students are prompted to respond with their bodies. In short, in starting an utterance with narrative and then laminating toward the end of each plot line, the embodiment of that narration appears to be reflective of the kind of action desired in response to the narration, and thus pedagogical. Thus, I have coded Charlene's apparent auto-RD as enacting both sides of adjacent-pair call-and-response. Specifically, I code the narration as a RP and the embodiment as a RR. Furthermore, through this

process Charlene also models what a “chained reflexive communication” (RC) looks like: reflecting on her enactment of the “love” between Grandmother and Grandson, Charlene reflects briefly on the axiological implication of this love, ostensibly marking that GC’s job is to “>take care<” of Grandson. Soon, the students will appear to perceive and integrate this patterning of RA and join Charlene (and eventually begin to lead her) in responding with their bodies and even chaining on their own RCs.

Marvin’s role as a pivot not only helps develop RA on the mutual orientation of interactive substrate, but it also signals the interactive framework expected of the group. In short, without explicitly telling the group that they will enact the story with her, by inviting Marvin to “help” her and by positioning him as a character in the story, Charlene is implicitly signaling to the group how they will be invited to participate. This invitation becomes more explicit with her first RP, which functions similarly to Gabe’s first RP in that it solicits collective RR. Just as Gabe’s ostensive markings throughout his turn hinted at his own RA leading up to his prompt for collective RA, Charlene’s anacoluthic self-interruption followed by a pause also suggest her own RA as part of prompting collective RA. Speeding up her speech tempo and inflecting toward a higher-pitched inquisitive tone, Charlene asks a question that laminates (1) a call for an adjacent pair response (RR), (2) a prompt for RA (remembering), and (3) an RO toward which the RA is directed: how Grandmother creates shade for Grandson.

The ratifying response from the group laminates several responses. It ratifies Charlene’s bid for contingent responsivity between herself and the group, as indicated by her turn-ending RP calling for an adjacent pair RR. It also signals to Charlene that the group understands and is willing and able to utilize their bodies, in addition to their words, to participate. And it ratifies that the group is willing to participate in the story-telling. Charlene responds to this response by

mirroring the RR in both words and embodied action (Gabe mirrors the action as well), with the effect of affirming the collective reply, marking Charlene's contingent responsivity to the group's response, and holding the semiotic value of their response in place for further action (thus, I coded this strip in purple). In this sense, while not marking this turn for deliberate reflection, it does appear to consolidate it and foreground it as a pre-reflective object, signaling to the group that this point has a greater potential for cuing again in future interactions.

480 Charlene: **(((Charlene drops arms and stops embodied actions)**
 481 **[and when (.) #it's >very windy out<# (.) <^what does Grandmother Cedar**
 482 **do^?>**
 483 **((Nina continues to hold both arms up covering Regan who is taller than**
 484 **she))**
 485 Gabe: **(((raises and extends arms in front of his body))**
 486 Charlene: **(((extends both arms forward, left arm shoulder height, right**
 487 **arm waist height, extending fingers in front of and facing**
 488 **Marvin))**
 489 **(((turning body toward Marvin, arms bent 90 degrees))**
 490 **[She blocks the wind**
 491 **so that poor little grandson cedar tree <when it's really**
 492 **[windy>**
 493 **(((waving hands back and forth in front of Marvin with increasing**
 494 **intensity))**
 495 **(((Nina extends her arms out in front of Regan's body))**
 496 **((to Marvin)) <*pretend it's really windy*>**
 497 **[and he's (.) twisting this way and that way (.) OH no!**
 498 Marvin: **(((Marvin begins to sway his body back and forth))**
 499 Charlene: **(((extends arms and hands in front of Marvin))**
 500 **[and then I >block [it<**

501 **(((Marvin stops swaying))**

502 **(..) and he's >all safe<(.**

503 **(((Charlene drops arms and turns body back toward group))**

504 **(((Nina drops her arms))**

505 **and then (.) when um Grandson Cedar**

506 **—when [#the deer: (.) start to nibble (.)#**

507 **(((raises hands to mouth and shows teeth))**

508 **(((turns toward Marvin again))**

509 **[and they get hungry**

510 **<and they start to [nibble> and they're eating all: of his >#tender little**

511 **branches#<**

512 **(((Charlene extends pinched fingers and play-pinches at**

513 **Marvin's arms)**

514 **<what does Grandmother Cedar do?>**

515 **Marvin: (inaudible) shoos them**

516 **Charlene: (((extends both arms fully in front of body, hands facing downward,**

517 **flipping hands from low to high in a shooping motion))**

518 **[shoos them. shoos away the (.) deer**

519 **((several youth repeat this action almost immediately after Charlene**

520 **commences this action))**

521 **(.) and when he's lo:nely (.) ((orienting head to Marvin)) *what do you look**

522 **like if you were lonely?***

523 **Marvin: mmm:**

524 **Charlene: you'd be sad?**

525 **Marvin: mm-[l: don't know**

526 **(((Marvin folds arms and hands over the top of his head))**

527 **Nina: ((Nina waves both hands toward herself))**

This chunk provides further insight into how RA can be an interactive resource for webbing together different aspects of the doubly-laminated interactive substrate that includes how to tell the story and the content of the story (without extensively reflecting further on either of these, yet). Again, through multi-modal ostensive marking that heightens attention to specific words, the doubly-laminated substrate of the GC story has expanded to include windy, block, nibble, shoo, and lonely, as well as their accompanying iconic embodiments.

The context-specific interactive patterns of RD appear more and more integrated into the group participation framework. Whereas up to this point, most the RA to move along the storyline has been prompted and executed by Charlene, in this chunk the variable possibilities of RA in this activity become more apparent. Charlene offers her second explicit RP, and the RRs demonstrate again how anyone, including Charlene and Gabe, can respond to Charlene's prompts. This turn also makes clearer a particular discursive format which Charlene is operationalizing for explicitly prompting collective response: she sets up a tension in the story calling for resolution with a temporal consequentiality (see also Labov, 1972). Thus, Charlene utilizes the conditional "when" to signal that this structure is in play and that students are being positioned to respond once she finishes articulating the conditions. In turn, collective RRs are evidenced in all of these cases.

However, embedded within these macro-cycles of conditional narrative developments are micro-cycles of interaction that continue to expand the social distribution of RA. A student, Nina, not only integrates the practice of laminating embodied action to a particular narrative development, but specifically layers on the "next response" in the story. In other words, rather than embodying the wind, as Charlene is describing it, Nina displays how GC would respond to the wind. While there's evidence of Charlene prompting Marvin specifically to embody his

narrated role, then Marvin, too, displays an integrated understanding of how to embody a response to the narrative development without narrative prompting. In other words, he now understands that a development with Grandmother activates an appropriate response in Grandson. After Marvin stops swaying, Charlene briefly pauses, still oriented toward Marvin, and reflexively reflects on the effect of the action in the RP-RR pair, saying he is “>all safe< (.)”. Thus, for the first time Charlene layers a reflexive communication (RC) to a RR offered by a student. In her next conditional RP, signaled by “when”, Charlene returns to the structure of reflectively embodying her own narration as she develops the entire prompt. Marvin now expands his participation by contributing to the spoken narrative as well.

However, when Charlene explicitly the positions Marvin to respond, he appears reluctant to respond in words, though he does appear to embody some kind of response. Charlene’s prompt seems different from the prior ones, in that it appears more open-ended and perhaps abstract to Marvin, asking him to respond with either body or spoken words to what loneliness looks like. While Marvin was able to provide the expected discursive reply in the prior sequence, the shift to an in-frame position eliciting an open-to-interpretation embodied response leaves Marvin without a response. Charlene’s RP is distinct from others in that it appears more open-ended rather than known-answer, and it is marked differently than Charlene’s other questions, which are typically at a faster tempo and in a louder voice. Asking a more open-ended question, positioning a student in-frame in the role of Grandson Cedar, and asking for an embodied response all initiate a transition from the known-answer participation framework of “remembering” and characterized by narrate-and-embody (in that order) to a play-and-reflection participation framework characterized by embody-and-narrate. Rather than signaling lack of student knowledge or ability, Marvin’s response may have signaled that indeed the activity

structure was changing, which may be why Marvin appeared unsure how to respond. In turn, this transition required further interactive work. Indeed, while the cuing of group-wide embodied enactment was continually layered onto the narration, in the next sequence Charlene used the second person pronoun just one more time, to round out Marvin's in-frame position as lonely Grandson cedar, before switching back to third-person pronouns until the group had built up greater familiarity with the cognitive work entailed in enacting Charlene's narrated RPs.

This interaction, however, does show how youth can display RA through their bodies even when words may not be readily available. An activity like this marks as valuable and salient the role of bodies in "thinking aloud," creating a space for Marvin to begin exploring with his body where his spoken words do not yet know where to go.

528 Charlene: oh okay (.) **(((Charlene turns toward the group))**
 529 **[uhm and if you were lo:nely (.)**
 530 **(((Charlene, upper arms akimbo, and lower arms rotated so hands facing**
 531 **herself**
 532 **with palms open, waves her arms and hands toward herself)**
 533 **(((several youth quickly enact this same motion, starting and stopping in**
 534 **sync with Charlene))**
 535 **[she calls i:n the squirr:els and the bir:ds (.) and she calls in um the**
 536 **butterflies and she says "come and be with (((turns head to look directly**
 537 **at Marvin))**
 538 **[my Grandson Cedar"**
 539 **(..) and then he gets older**
 540 **[(.) and *bigger (.) and bigger (.) and bigger* and pretty soon he's really**
 541 **tall:**
 542 **[(Charlene bends forward and downward toward Marvin, puts hands on**
 543 **legs, and**

544 **crouches down to ground so she's shorter than Marvin))**

545 **(.) and the sun starts beating down on #Grandma Cedar# and she's**

546 **getting**

547 **[#h::ot# and she's #getting t(h)ired#**

548 **(((Charlene places back of left hand on her forehead tilting head slightly**

549 **back))**

550 **and what does he do?**

551 **(((Marvin raises both arms hovering his hands above Charlene's head))**

552 **[(.) he creates [sha:de for her**

553 **(((several youth raise hands above their neighbor's**

554 **bodies))**

555 **(.) and when it's**

556 **[#REALLY WINDY AND SHE'S**

557 **(((Charlene starts rocking her body left to right, waving her arms))**

558 **[BLOWING THIS WAY AND THAT#**

559 **(((Gabe makes blowing noises))**

560 **(.) what does he do?**

561 **(((Nina holds arms in front of Regan's body))**

562 **(((Charlene looks to Marvin)) <^what do you have to do?^>**

563 **(((Marvin holds his arms in front of Charlene))**

564 **Charlene: [yeah (.) he gets in front of the wind and he creates a #barrier# between**

565 **her and**

566 **the wind**

567 **(((Charlene stops shaking))**

568 **(((Gabe stops blowing))**

569 **(.) and when she's [#lo:nely (.) and there's nobody to talk to (.) and there's**

570 **nobody to be with#**

571 **(((Charlene makes sobbing sounds and drops head))**

572 >what does he do?<

573 ((Marvin and Nina both wave their lower arms and hands toward
574 themselves))

575 Charlene: (.) yeah, he >calls in< all of the birds and um
576 all of the other animals to be with her
577 (((a few youth motion both hands toward their bodies))
578 (((Gabe walks over to Charlene and flitters his fingers above her head))
579 (((Miguel walks toward her, mouth agape rotating arms up in air))
580 ((group laughs, Charlene looks toward Gabe and laughs))

581 Charlene: (((Charlene looks to Miguel, as he's waving his arms and she's still
582 crouched))
583 ((.) and what else Miguel? <I'm missing one more thing> do you
584 remember?

585 Miguel: mm

586 Charlene: when he's (((holds up one thumb toward Miguel))
587 [lo::nely (.)

588 Charlene: (((Charlene looks to and points at Jake))
589 [Jake?

590 Jake: the deer start [to nibble.

591 Charlene: (((Charlene pulls hands to her chin, facing inward, and
592 shakes))
593 [the deer <start ^to nibble at me AHH!^>
594 ((Gabe runs up to Charlene and makes nibbling gesture towards her with
595 his hands))
596 and [what does he do?
597 (((Marvin starts to wave both hands in shooping motion))

598 Charlene: he shoos them [away:: ((laughs))

action (Schön, 1983) that is marked differently from the reflection-on-action that is marked here (Schön, 1983). This a significant finding here, with potential implications for how practitioners distinguish between reflection layered into play versus reflection layered onto play, as well as how reflective practitioners more generally make such laminations. The interactive emergence and clarification of a distinction between reflection-on-action and reflection-in-action is signaled multi-modally and sequentially by disparate interactive resources: tones of voice; participation structure; emplacement in narrative/discursive arc; and timing of lamination.

Charlene's RP practices are a central resource she uses pedagogically. Participant responses indicate the success of this pedagogy, and thus the learning that is occurring both in terms of how to participate in this specific kind of RA and how to enact the GC story. By the timing of their embodied RRs to RPs, the participants demonstrate their understanding of the participation framework for this situated practice of RP-RR. The culmination of the youth integrating the RA practices of this activity comes when Charlene prompts them to supply both parts of the final dyad in the Grandson's reciprocal caring relations to Grandmother: nibble-shoo.

This chunk also evidences to the group, for the first time, how RCs reflecting projectible actions can be chained onto prior RAs. In the prior chunk, Charlene's RC reflected on a novel narrative implication of Marvin's embodied action, but it did not yet shift to the next sequence in the unfolding of the story. In this chunk, when Marvin embodies the protective gesture made by Grandson for GC, first Charlene layers on the narration of that move, which expands it modally—a move quite familiar to the group by now and not reflectively novel—but then she and Gabe enact the embodied effect of Marvin's action, thus semiotically displaying the next sequential action of the story. Student integration of reflectively enacting sequential actions is

indicated again when Miguel (simultaneous to the same action as Gabe) enacts the sequential effect of Grandson calling in animals to bring company to Grandmother.

The final exchange of the macro-cycle indicates further expansion of how the young participants are beginning to expand on the structure of the activity. As the collective activity and group affect appears to intensify at the culmination of the story, Zale runs toward Charlene, spontaneously adopting the position of the deer and prompting Charlene to respond, exhibiting that the youth are (1) beginning to spontaneously step into embodying the story, (2) capable of prompting RA as they begin to integrate the situated practices of RA for the given activity, and (3) willing to take multiple perspectives beyond those of the two main characters, expanding the sense of “who can be whom” in ecosystem enactment.

After the storytelling segment ends with laughter, the group affect intensity lessens, and Charlene enacts a clearly marked reflective shift for “stepping back” (Cobb et al., 1997; Ackerman 1996) that ostensibly marks a space for more extensive, intentional reflection.

- 604 **Charlene:** **(((Charlene stands up and squares to face whole group))**
 605 **((..)) and so ((..)) (((holds hands to her sides at waste, palms facing up and**
 606 **slightly**
 607 **outward))**
 608 **[^what did we lear:n^ ((.)) in that story?**
 609 **(((Regan holds her hand up))**
 610 **((Charlene points to Regan))**
 611 **Regan:** **(inaudible) I can't figure out how to say it (.) but to take care or like (.) to**
 612 **^give back^**
 613 **Charlene:** **mm-hmm (affirmative) to reciprocate**
 614 **(.) does anybody else know what reciprocate means? (.) To be reciprocal?**
 615 **(.....) No?**
 616 **((to Marvin)) Yeah you do?**

- 617 Marvin: mm (.) actually I was just waving at my: sister
- 618 Charlene: oh, yeah(.) so it's helping one another, [((nods head up and down))
 619 [right? when somebody does
 620 something for you when they take care of you, you take care of >them
 621 when they need it<
- 622 Gabe: it's a [sense of—
- 623 Jeanette: [think of a teeter-totter (.) a teeter-totter is reciprocating
 624 (.) you know teeter-totter?
- 625 Multiple: uh::
- 626 Jeanette: [((holds left arm high and right arm low and joins arms at hands, matches
 627 motion of going up and down in alignment with her words))
 628 [when one is up (.) the other's down (.) and then when the other's
 629 up (.) that's called reciprocating.
- 630 Gabe: Balance.
- 631 Zale: I'm good at those.
- 632 Gabe: good. [(.) you'll need that today.
 633 [((Gabe places right hand on Zale's head))

At the starts of this series of turns, Charlene asks a question that displays significant ostensive prompting for stepping back (which Charlene literally does with her body as well) and reflecting on the story they just told. The manner in which she ceases animating both her body and voice signals a shift to the group. More deliberately reflective in its intent to stop action than the numerous RPs displayed during the storytelling, this call for RA appears to usher in an activity shift from the relatively phatic process of generating the story to an interactive space for reflecting on what just transpired. Charlene's paralinguistic cues in asking this question are distinct from prior questions, in that it's much slower, broken up by multiple pauses, and uses the modal metapragmatic “^what did we lea:rn^” indicating that learning has happened, that it

occurred during the storytelling, and that a time-space was now opening to reflect on that learning. With the content of the story itself (but not necessarily the interactive process of storytelling) as the RO, the RP calls for RA on what was learned.

When Charlene calls on Regan who speaks quietly but sounds knowledgeable, the group remains quiet and attentive. The interactive pace here is notably different from earlier during storytelling: slower, longer turns, longer spaces between turns. The ostensive cuing here is not just itself a palpable modulation of the spatiotemporal rhythm of the activity (Gergely, 2007), but the interactive time-space opened up by it retains a distinctly different rhythmic feel than the phatic storytelling. Regan's response appears to align with an answer that Charlene seeks, as Charlene revoices (Forman & Ansell, 2002) it using a single lexical item, "reciprocate," that appears to be a reflexive response (RC) to Regan's prompt for a succinct descriptor, summarizes what Regan has described, and creates a ground for further elaboration. When no youth offer elaborations, Charlene, Jeanette, and Gabe—all adult facilitators—offer ways of conceptualizing this term, which is one of the central values of I-STEAM 2015. Zale replies that she is good at teeter-totters, which may also imply good at balancing and reciprocity, which Gabe reflexively chains to, indexing participant capacities that will get activated during the forthcoming activity. This also exhibits how facilitators can convert spontaneous phatic connections of participants, such as an alignment chained to prior discourse (i.e., being good at teeter-totters), into objects for reflection that facilitate transitions into designed learning activities. Thus, Gabe's felicitous response initiates the transition into the launch for the next activity and further displays how RA functions not only to set up relays (through chaining and webbing) within an activity but also across activities.

Discussion. The arc of the lesson evidences how RDs and PCs helped facilitate several learning outcomes:

- 1) Recalling and participating in telling the GC story
- 2) Participating in a contextualized practice of RA that distributed paired actions in the story (e.g., wind-block) across adjacently paired RD turns (RP-RR)
- 3) Laminating story narratives with words and embodied iconic actions
- 4) Identifying “four relations” between cedars in both words and body
- 5) Preparing the ground to begin thinking beyond relations beyond the four of the story by developing the agentic capacity of participants to engage in spontaneous play-and-reflection

Overall, this somewhat brief activity (about 10 minutes) makes substantial contributions to understanding the plasticity of RA that affords highly contextualized operationalization. RA was not only implicated in launching the activity, participation structure, and interactive substrate, but it was also a central interactive resource to transforming the participation structure and interactive substrate. RA was differentially distributed across participants, depending on how novel or familiar particular situated actions were to participants.

Over the course of the activity, the group displayed signs of integrating (or, appropriating) the practices of the activity: Charlene narrated a part of the story, prompted the group to embody, and then they enacted it. The prompting to embody was done in three ways: (1) Charlene embodied and the group mirrored; (2) Charlene told the group to embody a particular action with their bodies; (3) Charlene directed an RP explicitly to the group and they responded with words and embodiments. Charlene mixed explicit prompts, which received wide response, with implicit prompts modeled by how she timed the laminations of her embodied

enactments onto her narrations. Importantly, as they were designed by Gabe (de los Angeles, 2016), Charlene's moves helped to scaffold the transition toward the practices of I-STEAM LARP. Many in the group appeared to quickly adopt the adjacent pair distribution in the double lamination of narration and embodiment. At times, the group enacted after Charlene or Gabe, displaying embodied iconic actions almost identical to Charlene or Gabe. As the activity unfolded, the group began to precede Gabe and Charlene and even reflexively chain sequential actions onto the unfolding story.

Double laminations and RA. RA was not only distributed across double laminations of narration-and-embodiment and play-and-reflection, but also afforded such distributions. For example, the pairing structure of the story was interactively distributed through the distribution of RA, whereby a prompt named one half of a pair and called for the other: e.g., Grandmother-Grandson; hot sun-shade; windy-block; nibble-shoo; lonely-call in. Furthermore, each word was doubly coded with embodied iconic expressions that got quickly propagated through the group. This participation structure aligned well with the 'importance of the story,' in which Grandson later reciprocated the same caring actions toward Grandmother; here, the paired actions remain the same but the role responsibilities of Grandson and Grandmother were reversed. In short, the participation structure distributing RA, narration, and embodiment was ideally suited for aligning this activity with the broader I-STEAM goals to teach youth about the roles, relations, and responsibilities among different eco-relations.

More specifically to I-STEAM LARP, the relation of narration and embodiment in this activity is noteworthy for how it prepared students to be players in LARP scaffolding exercises throughout the coming week. Initially, narrations preceded embodied action, though as the activity progressed, as participants learned the participation framework of the activity, they

showed increasing capacities to take the lead in embodying actions that eventually even drove narrative elaborations. The overall arc of shifting from narration-and-then-embodiment to cycles of embodiment and narration in which each cyclically drove the other runs across the LARP data in both years, as students integrated the scaffolding activities into their own repertoires of LARP practice. Thus, whereby narration anticipated and suggested the forms of embodied play to follow during this activity, later, when LARP was no longer grounded in a known story, embodiments began to precede narration, and narrations themselves began to function more reflectively, naming and elaborating on embodied actions. The moves by Marvin, Nina, Miguel, and Zale all evidenced how the youth were beginning to learn how to drive the storying of I-STEAM LARP.

The manner in which narrative moved shifted from prompts toward action (to embody the narrative) to reflections on emergent embodied actions highlights the value of attending to how interactants drew on RA as a resource for this transformation of participation structure. Even as the activity designs called for such a transformation, the interactants still had to accomplish this interactively. This interactive process also taught the group how to engage the situated practice of RA in this activity. The group learned how to embody RRs to RPs designed to elicit more knowledge about how the story unfolds. Many in the group initially form dyads, implicitly distributing in their dyads the roles of Grandmother and Grandson, at first mirroring and then even leading the actions of Charlene's lead triad. As the number of characters in the story expanded (e.g., wind, deer), and Gabe, Charlene, and Marvin distributed the different roles to accord three players (beyond GC and Grandson), the dyads began to expand to larger groups as well.

The lamination of narration and embodiment also exhibited another layer of complexity. Narration can stand outside the story, telling it third-person, or it can stand inside the story, first-person. Charlene moved between both positions. As participant-players aligned with story characters by pivoting their bodies into the story, Charlene shifted her pronoun from third person (Grandmother Cedar) to “I”, in temporal coordination with her action (“I block it”). This move laminated a narrative shift of narrator (from out-of-frame to in-frame of the playworld) onto the embodied pivoting already in motion and carried into the next RP-RR pair. As this exchange started, Marvin provided the desired answer as ratified by Charlene. Charlene then asked him a follow-up RP, shifting pronoun from “he” to “you,” positioning him in-frame in the story, in affective alignment with Grandson Cedar, asking for an embodied reply. This move appeared to initiate expanding the narrative shift to “helpers” in the storytelling, explicitly positioning in discursive alignment with his embodied pivoting. Not only did these moves continue the participation structure of storytelling, they also laminated in-frame enactment onto out-of-frame narration creating the playworld (Lindqvist, 1996) in which a story becomes a substrate for imaginative and embodied role-play.

The pivots of play are pivotal in affording double laminations of narration-and-embodiment, play-and-reflection. The interactive work to continually re-enact and maintain the embodied pivots of play is made visible through multi-modal IA. Pivots are not simply invoked during play and retain a steady identity as such in the invisible and internal minds of actors, but are interactively created, identified, maintained, and transformed. Considerable interactive work goes into pivot activation and enactment. The pivots of play are pivotal in affording double laminations of narration-and-embodiment, play-and-reflection. The interactive work to continually re-enact and maintain the embodied pivots of play is made visible through multi-

modal IA. Charlene turned to look at Marvin just as she adopted a first-person perspective and spoke as Grandmother Cedar, calling Marvin “my grandson,” an interactive move whose endogenous sense of power is heightened when viewed from Charlene’s POV camera. Marvin was interactively marked and positioned again in as Grandson Cedar, showing how pivots are not simply invoked during play and retain a steady identity as such in the invisible and internal minds of actors, but are interactively created, identified, maintained, and transformed.

Considerable interactive work goes into pivot activation and enactment.

7.27.15 Monday LARP MB small group

For this activity, the whole camp was divided into three groups: youngest, middle, oldest. This transcript follows the youngest group. Initially, as in most LARP activities, Gabe was positioned as lead facilitator. However, Gabe needed to help launch the other two groups, and MB took over for him. MB and Charlene co-facilitated as the group explored the life of cedar including and beyond the “four things” learned through the GC story. There were 13 human actors in this group: 2 adult facilitators, 9 youth, one cameraperson (myself), and one adult observer. The group organized itself into a proximal yet shifting arrangement in the middle of a large open field.

This activity is distinct in significant ways from the one immediately preceding it, the whole group telling of the GC Story. Here, participants are immediately cued to be much more active in embodying the “life of a cedar tree,” and the overarching activity structure affords a different way of doubly laminating play-and-reflection, narration-and-embodiment. Throughout this episode, MB’s RPs activate laminations of embodied enactment of play-frame to mediate the RAs of the group’s RRs. Several layers of action are simultaneously in motion: layering of body, play, cognition/reflection, and perspective-taking; engaging embodied play as mediator of

cognitive/reflective processes; and learning perspective-taking through lamination of playful embodiment and topical discourse onto the activity substrate, cedar tree life cycle.

The transcript picks up as MB takes over activity leadership from Gabe, building a phatic connection through an activity frame of collective imagining (“let us imagine”). To develop toward this trajectory, MB activates the substrate developed in prior activities of learning together about “the life of the cedar” and orients it toward further development in the forthcoming activity. Her prosody and pronoun use appear to develop the contingent relationality of the phatic connection linking herself to group and activity substrate. This interactive work appears to generate mutual orientation (Goodwin, 2018) to the task at present, attending to MB’s words, whereby in turn her words orient to forthcoming RA of imagining the life of cedar.

- 634 **MB:** **What do we think cedar's: life is like? Let's ima:gine**
- 635 **(((MB turns face and orients eye to Gabe))**
- 636 **[the life of the cedar [is what I think what you're after, right?**
- 637 **(((Gabe rotates upper torso toward MB, into the O-**
- 638 **space, points at**
- 639 **her, and steps toward r-space outside of o-space))**
- 640 **Charlene:** **mm-hmm**
- 641 **MB:** **((MB looks across o-space at Charlene))**
- 642 **All right. So did we[: learn a little bit >about the life cycle< of a cedar**
- 643 **today^?**
- 644 **(((tilts head slightly to right))**
- 645 **(((lifts lower arms, holding hands at shoulder length with palms open and**
- 646 **facing outward toward Charlene))**
- 647 **[Did you use that?**
- 648 **Charlene:** **A little bit**

Initially, MB appears to be confirming with Gabe, publicly displayed for the group to observe, the launching frame for the activity as she cues “imagining the life of the cedar” as the activity substrate for transformative action. The way MB and Gabe orient their bodies toward each other as well as the verbal confirmation of the activity frame laminates both contingent signaling (bodily orientations toward each other) and ostensive marking (identifying a substrate for RA), illustrating how contingency and ostensive signaling are often done synchronically through multi-modal laminations.

After quickly developing a contingent connection to Gabe and his design frame, MB appears to more directly orient to the whole group with a contingency evoking signal in her prosodic modulation of “we::” before quickly shifting to “you”, positioning herself as an outsider to some insider knowledge necessary to launching the activity. This positionality heightens the sense of her highly ostensively marked question as being information-seeking, and thus initiating a basic form of pedagogical communication (Csibra & Gergely, 2009). Charlene’s response is informative to MB, autonomically reflecting that the group had learned “a little bit,” giving some indication of how much MB could assume about the group’s connection to the activity substrate. Thus, MB’s RP to Charlene generates some pedagogical information, in addition to cuing the intentional orientation of the activity, effectively informing MB where the group stands epistemically in relation to the substrate she is cuing. With the substrate cued, MB quickly initiates interactive work on reflectively transforming the substrate.

649 **MB:** **So does everyone—[[opens arms outward to either side of her body,**
650 **palms open**
651 **facing the sky]]**
652 **[what does cedar start out like? Can everyone show**
653 **me:?**

654 **(((steps back with her left leg, pauses, and then follows with her right))**
 655 **[Try to make it with your body. Be a #young: cedar**
 656 **[tree# (.)**
 657 **(((Miguel begins to crouch and then Zale just behind Miguel and to**
 658 **his right starts crouching into a squat a split second later and**
 659 **then Charlene and Pearl and Olive squat))**
 660 **[What do you think a you::ng cedar tree is like?**
 661 **(((MB crouches down into a squat))**
 662 **[right here (...)((MB places hands on ground in front of her squatting**
 663 **body))**
 664 **((Alvin and Sal squat down and Tommy follows a split second later))**
 665 **(((David kneels on one knee facing the o-space))**
 666 **<as close to the ground> (.) ((Charlene laughs))**

In asking “what does cedar start out like?” and “what do you think a young:: cedar tree is like?” MB orients to the “start” of the cedar tree “life cycle,” selecting this aspect of the substrate as the RO for RA. Her use of the metapragmatic “think” explicitly activates intentional RA. The RP also frames the modality of response, to “show” with “your body.” The substrate is developed on three layers and MB’s RP positions participants on these three layers at once: in-frame of I-STEAM themes as participants in a reflective discourse about cedar tree life cycle; on the rim of the frame of a playworld as players reflectively thinking about how to use their bodies to play-act; and in-frame of the playworld as embodied cedar trees. Thus, the laminations of MB’s RP affords engaging reflective and cognitive tasks (learning about the life cycle of cedar tree) through embodied play-actions in a play frame, signaled by alignment with activity launch frames (“role-play cedar”) as well as a particular ethos of role-play “be a young cedar.” The RP itself stands on the rim of the frame, looking into the frame with the group and prompting how to

enter into the frame, whereby MB also models how to be in-frame by embodying an RR to her own RP.

This is all familiar to the group, as they re-use (Goodwin, 2018) what was modeled moments earlier during the whole group telling of the GC Story. The group collectively responds with their bodies, though response times vary within the group, and degrees of understanding the significance of their responses likely vary within the group as well. The response by the majority of the group indicates that the contingent relationality of the phatic connection is largely mutual. Affirming what they had learned during the prior activity, interactants signal that they understand that adjacent pair responses do not need to be vocalized, that embodied responses autonomically reflect that players are reflecting on how to communicate iconically with their bodies. This affirms again that embodied actions can be autonomically and intentionally reflective without discursive mediation. In this activity, as the one before it, embodied responses appear interactively sanctioned as part of reflective discourses, even as the activity is still mediated in part in discourse and key framing moves are offered discursively. Indeed, MB's response to their embodied responses is to laminate a narrative frame onto their actions, partially encoding their embodied responses as discursive objects. She does this by chaining to the group's RRs with her own RC that converts their action to a RO, linking it to land ("close to the ground").

Very quickly in this activity, with little phatic connecting needed, MB has set in motion (1) interactive frames of co-operative action toward intentional objects of their situated and endogenous activity system; (2) a play frame of being a young cedar with their bodies which itself involves players (a) on the rim of the frame narrating how to mediate playful actions with their bodies during (b) in-frame role-play of being a cedar; (3) a pedagogical frame oriented toward I-STEAM learning objectives. After narrating the embodied reflective responses,

partially encoding these actions as discursive objects, MB prompts another reflective transformation on the evolving substrate.

- 667 MB: **(.) but what happens before we're even a young cedar tree? (..)**
- 668 **[What are we?**
- 669 Zale: **[a little (((pinches the pads of her right index finger and thumb))**
- 670 **[seed.**
- 671 MB: **We're a little (((mirrors Zale's pinching gesture))**
- 672 **[a little cone seed, right?**
- 673 **[So can we get #e:ven tighter#? (.) #so: tight# (.) be a little seed?**
- 674 **(((starts to lean forward and curl herself into a fetal ball))**
- 675 Multiple: **((Most youth begins curling into fetal balls))**

MB initiates the second reflective transformation of the substrate. MB's framing of the RP transforms the positionality of the group vis-à-vis playworld frame, as MB shifts from addressing the group as "you" standing apart from "a young cedar", to "we" signaling in-frame standing and alignment with cedar identity. Chaining to the embodied expressions of a "young cedar tree", MB prompts reflection on what they were before then, transforming their embodied RR into a RO for RA via the reflective framing (RF) of "what happens before". Whereas the interactive telling of the GC story was largely built through chained dyads (i.e., two roles, two actions at a time) and then webbing across the dually structured four inter-actions, chaining of play-and-reflection figures more prominently in the current activity structure. Thus, MB's transformative RP demonstrates how embodied RRs will be transformed into ROs for further RA throughout this activity. Whereas the GC story focused on webbing relations across four adverse conditions, this activity follows the sequential "life of a cedar." Such an epistemic agenda aligns with the structure of RD chaining.

As she repeats her question, enhancing the interactive sense of its importance and candidacy as a prompt to reflect and respond (Barron, 2000), Zale responds multi-modally, simultaneously in utterance and body. Zale's response mirrors all three layers of MB's framing actions: (1) She embodies the response by pinching her fingers, positioning her body and the group's body on the rim of the playworld-frame looking at the imagined seed between her pinched fingers; (2) says "a little seed" participating in the discursive mediation of the narrative stance toward being a cedar seed; and (3) helps develop the pedagogical substrate oriented toward I-STEAM learning objectives by proposing that cedars start out as seeds. This mirroring also reflects and affirms the mutuality of the contingent relatedness between MB and Zale. MB responds by integrating Zale's response into a more elaborated response, further signaling mutual contingent relationality in reusing Zale's language and meaning, to prompt (RP) group mediation (RA) of the RR with their whole bodies, laminating the in-frame stance in language ("tighter") with its embodied mediation.

The result is a transformation of participant bodies, laminated with MB's discursive transformation by linking tightness (or, density) to cedar seed, to transform the interactive substrate of the "life of a cedar tree." Interactively, MB's response affirms again how, in this particular activity, RA can be directed toward and mediated by embodied actions and not just discursive objects. Discursively, MB ratifies and chains onto Zale's RR, and MB layers on an embodied shift that reflects a different expression of how a human body reflects a cedar seed (with whole body and not just pinching fingers). The effect of the embodiment transformation is to align the body's stance with the discursive pronoun use, helping players to multi-modally enter the playworld. Furthermore, through the chaining of RA, the participants' embodied RRs of being a seed becomes a RO that is further transformed by RA into a "little cone seed" which is

laminated with in-frame play prompt to embody the action of growing tighter, which aligns in-frame play-action to out-of-frame cognizing of seed density (though the verbal link to density remains a pre-reflective/potential object in the interaction).

How RA is distributed across these turns illustrates how RA functions in this activity on multiple layers: (1) it maintains the contingent relatedness of the interactants; (2) its structure enables socially distributed and multi-modal participation in play-and-reflection; (3) it develops pre-reflective actions with the potential to become ROs through subsequent RA; (4) it transforms the activity substrate toward designed and emergent learning outcomes.

676 MB: ^And what—what happens in order for us as a seed to start growing?^

677 Pearl: Wa-ter

678 MB: Wa-ter:!(.) ^What else?^

679 UY: f[ood?

680 David: [su:n

681 MB: So let's breathe in ^what do we think our seed

682 [feels like^?

683 [((Miguel drops into fetal ball matching all youth except David and

684 Charlene))

685 ((Charlene glances over at David))

686 What a—<#we're a cedar seed# ^What does it feel like when we start

687 getting water?^>

688 [>What happens?< (.)

689 UY: [(.) (inaudible)

690 MB: ^Make your body feel like you're getting water on you.^

691 Miguel: ((Miguel shouts non-verbal sounds as he thrusts his upper body up,

692 springing his arms straight above his head))=

693 Charlene: =((Charlene laughs and turns to look at Miguel))

694 [Oo: you sprou^ted!

695 **(((Tommy stands up and shouts a vocalic noise as he raises his arms**
 696 **fully extended to his sides)))**

697 **MB: (((looks up at Miguel))**

698 **[Ohuh we've got one sprout! Oh:::**
 699 **^are we sprouting up^?**

700 **[(...)]**

701 **(((everyone in the group lifts up their upper bodies in sync with MB who**
 702 **also extends raises her lower arms to extend left to right at shoulder**
 703 **length and lower arms raised upward at ninety degrees, palms facing o-**
 704 **space; everyone except Marvin and David emulates MB's arm extension**
 705 **almost immediately)))**

706 **[Do we have our >first limbs<?**

707 **(((MB starts extending arms to her sides and 5 youth and Charlene**
 708 **emulate)))**

After narrating the tightening of the cedar seed bodies, making the action available as a discursive object, MB discursively chains a reflective orientation to this object, prompting reflection on conditions for seed growth. MB's prompt makes explicit an implication in attending to the seedling of a cedar tree, that the seed somehow grows into the cedar trees they learned about in the GC Story, and thus implicitly turns to the relational webs necessary for that growth. While the interaction does not make such webbing explicit in this RP, the broader interactions of this activity—as well as the broader goals of I-STEAM and the relational foundation of the GC story which provided the substrate from which the current activity launched—clarify that such a web is indeed the trajectory orienting MB's RP. The expansive webbing of the substrate of the life of the cedar, via chaining onto its earliest stages and reflecting on how it grows across its life cycle, becomes clearer as participants collectively start naming eco-relations of cedar. Indeed, the participant RRs of “water,” “food,” and “sun” are all webbed relations to plant relatives that

participants have been repeatedly learning at camp. In short, to a certain extent, the activity thus far has largely consisted of cuing up a webbed substrate familiar to many of the participants to prepare the substrate for new action (which will be to experiment with it via LARP as the students integrate more and more of the micro-practices of LARP). Thus, on both micro- and macro-cyclical scales, a process of chaining is at work, in which a transformation of the substrate becomes the object of a subsequent transformation.

Indeed, MB discursively chains onto the RO of water for further RA though the prompted RA is not for more verbal reflection, but embodied reflection of what a cedar body would “feel like” when it gets water. Miguel responds with what sounds like a cry of joy as he springs up from a crouched position. Charlene appears to interactively ratify Miguel’s playful expression by latching her laughter to his action and laminating a narrative rendering of his action, introducing a new layer to the substrate, sprouting. With this new word, sprout, Charlene’s narration functions as the first reflexive communication (RC) chained to an RP-RR sequence. While multiple RPs have functionally linked to RRs, helping move along the interactive substrate, this the first time an RR was directly chained to an RR without mediation by another RP (rendering it reflexive). The RA chaining from seed growth to affective response of sprouting in relation to water was distributed across three interactants, diagrammed as such:

MB: RP

Miguel: embodied RR

Charlene: RC discursively chained to Miguel’s RR

This micro-cycle marks two additional firsts for this activity: (1) a spontaneous enactment by a participant drives the narrative (rather than the other way around); (2) the reflective transformation of the substrate (sprouting) emerged from the spontaneous action of a participant

rather than from reflective prompting by an adult facilitator. Tommy then appears to emulate Miguel, though with variation, marking a contingent responsivity among young participants standing all the way up and making a different kind of vocalic noise. MB builds on this spontaneous momentum by orienting to the link between “sprouting” and its iconic action, and prompting the whole group to join in embodying the sprouting iconic behavior. It is noteworthy that had participants not spontaneously contributed sprouting actions, MB may have instead webbed over to prompting sprouting, given that webbing moves do not require discursive chaining. However, chaining this movement to the endogenous actions of the young participants appeared to have significant power in garnering collective response (indeed, this is the only time in the whole activity that everyone acts in conjunction). It is not clear if such a collective response would have been the same if, rather than chaining onto youth actions, MB would have initiated the movement to sprouting by webbing the relations herself. However, the shift to youth-driven momentum of action makes the next development especially intriguing, in which David chains to the question of what cedar needs to grow, reorienting group attention to cedar needs and eco-relations. For the first time in this interaction, a response not chained to the current RA is taken up into the web of emergent understanding. While David did generally exhibit some degree of contingent responsivity during this activity, “sprouting” was the only time during the activity in which his response was simultaneous with the rest of the group. In turn, David initiated a RD chain that demonstrated how students can shape the trajectory of the activity.

- 709 **David:** **We need nutrients.**
- 710 **MB:** **We need [nutrients!=**
- 711 **Charlene:** **[nutrients!**
- 712 **MB:** **^How do we get NU^trients?^**

713 David: From the soil.

714 MB: From the SOil!

715 ^So what do we need in the soil?^ (...) *What do we grow?^* (..[.)

716 David: [(inaudible

717 roots?]=

718

719 MB: =We grow roots.

720 [I'm gonna make my toes be the [(MB pushes left foot into ground)]

721 roots: I feel like my toes are growing (.]

722 and they're getting the nutrients

723 from the soil.

724 [(Charlene moves right foot forward and

725 pushes bottom of toes into

726 ground))

David's RRs to MB's RPs link cedars to nutrients through the soil, which also connects cedar to land (whereby I-STEAM codes "soil" as an expression of land). David's RR is also significant because while David has largely not participated in embodying the cedar for the LARP substrate of the activity, his response signals both engagement in the progress of the activity and an in-frame identification with the collective first-person identification with cedar. In this sense, the RA of collective activity is also a resource participants can use to signal the extent of their engagement in the process when they otherwise might appear disengaged.

In revoicing David's RR, MB and Charlene emphasize "nutrients," which both signals strong contingent responsivity to David's participation—which is noteworthy because David has participated the least with his body in this group—and marks this as worthy of further action. MB chains onto David's RR as the RO for further RA. David's RR to this RP is again chained into the next RP, in which MB asks for further RA on what plants need to grow to get nutrients

in the soil. MB's framing of this RP, in which she links plants growing something to get what they need in the soil, exhibits how the framing of prompts can layer on additional RA that is in itself pedagogical. Furthermore, MB's ostensive marking of "nee:d" affirms the importance of how often that word is getting repeated in this activity, linking what motivates cedar to the eco-relations it forms. Again, David reflectively responds and again MB appears to chain onto his answer. MB then reflexively chains onto this discursive frame to reflectively transform her words into embodied actions, linking plant roots to her toes, which Charlene affirms with a mirroring response.

At this point, several webbed relations of the substrate are surfacing across the activity: cedar tree life cycles begin as little, tight pine cone seeds in the ground and then sprout up with sun, water, and food, developing roots that can draw nutrients from its surrounding soil. Already, the layers add on to what they learned in the GC story, oriented toward the nested substrates of cedar tree, cedar tree life, and cedar tree life cycle. Furthermore, the speed with which youth embody responses to RPs suggests that the group is integrating the unique participation structure of this activity: a cycle of narrative prompting, embodied enactments, reflective discussions, and more embodied responses setting up further narrative or reflective action on the substrate as it has been developed. Thus, through social distribution of RA, laminated multi-modally through body and discourse, playworld and I-STEAM reflections, the activity substrate of learning about the life of a cedar is continually expanded.

Though this activity continues on for another 8 minutes, we will look at just one more macro-cycle, during which MB is now interactively positioned to introduce novel constructs webbing together cedar trees, winter (seasons), and cedar sap.

727 MB (.) And then: what starts happening?

728 Miguel: We get bigger.

- 729 MB: We start to get bigger? K.: How do we know: we're getting bigger:? (.)
- 730 What else is happening to us? (..)
- 731 Miguel: We start getting the flowers.
- 732 MB: We get flowers mmm (.)
- 733 UY: (inaudible) the leaves=
- 734 MB: =the leaves—you mean the needles? Yeah, we probably do get some of
- 735 those.
- 736 You know what though? I also think maybe we go through a winter (.) and
- 737 may:be we go through a summer:. There's a bunch of them probably so (.)
- 738 I bet it's [(shakes arms))
- 739 [cold
- 740 sometimes.
- 741 *Think cedar trees feel cold?* (.) Think we can #tell#? ^What do you think
- 742 happens^ when it's cold out inside?
- 743 Zale: [(Zale extends her right arm, hand, and fingers fully to her right))
- 744 [They get frozen.
- 745 MB: They get frozen? Maybe, but they probably get cold, huh? Yeah, all: of the
- 746 —do you guys know that we have blood inside of us and water inside of
- 747 us?
- 748 Multiple: Yes, yes
- 749 MB: You know that cedars have something called #sap# it's kind of like their
- 750 blood? But they have wa:ter, (.) and when it's rea:lly cold out (.) >it
- 751 doesn't move so fast< so they grow >slow::er:< <in the winter time.
- 752 And then the sun comes out and we get more rai:n> (.) a:nd I think we:—
- 753 ^I don't know, [what do we think happens if we get more:: sun and more:
- 754 rain and more:
- 755 nutrients from the soil?^
- 756 [(Pearl, Olive, and Miguel all rise to a standing crouch))

invitation (RP) to collectively engage RD (“what do we think...”) about the consequences (what...happens?) of what is happening in the substrate of a growing cedar enhancing its webbed relations (more::) to sun, rain, nutrients, and soil. The move itself is remarkable because in foregrounding the uncertainty of her own epistemic standing, MB is decentering herself from the webbed relations in the substrate, opening an interactive space for the participants to revisit and reflect again for themselves on how the webbed relations affect the substrate. This move also shifts reflective attention from the various underlying conditions for cedar growth to reflecting on a grown cedar and the process of aging.

The response to this reflection is that “you get tall”, a response that appears to satisfy MB’s intention to turn to a new macro-cycle, while playing forward that some youth continue to standing on the rime of the playworld. MB’s response uses pronoun action to place the respondent back inside the playworld, a position ratified when another youth affectively exclaims “here we go!” signaling a reflective stance toward the affective joy a plant might feel as it grows upward.

In the remainder of the activity, through co-operative actions the group layers micro and macro-cycles of learning through play-and -reflection. Both playful and reflective aspects of the interaction play forward the activity substrate toward which the interaction is oriented, continually transforming the substrate with laminations of semiotic-material layers mediating the onto-epistemic navigations of the group’s activity system.

7.29.15 Wednesday Gabe LARP Launch

Gabe is launching a LARP activity that will go beyond cedar tree perspectives. A group of 5 adults and 16 youth sit in a large circle in a field. This activity launches and frames the forthcoming activity by interactively cuing the substrate of prior play activities for reflective

transformation toward axiological aims. The axiological framing of the substrate in turn grounds the activity they will launch into after this one.

- 775 **Gabe:** **Alright guys. ohwhh.**
- 776 **Priya:** **David**
- 777 **Gabe:** **David (.) come on in. (...) Alright guys, I'm gonna talk to you about for the**
- 778 **stuff for a little minute then we're gonna do (.) #a bit of play and pretend**
- 779 **around here. (.) There isn't enough playing going on, [I think#**
- 780 **(((Ninja leans up and forward, covering mouth)))**
- 781 **Ninja:** **Yeah there isn't.**
- 782 **Gabe:** **exactly that.**

Initially saying “alright guys” as an attentional directive appears to be Gabe’s initial attempt at interactively establishing the contingent relationality of the phatic connection. He is drawing attention to himself orienting to the group. He then makes an audible non-linguistic grunting noise that sounds like he’s signaling his affect as he settles into the situation he has designed for and is now facilitating. He then calls in David, who was standing away from the circle, an interactive move that appears to affirm Gabe’s concern for signaling contingent relationality to the group. He then restarts (Schegloff, 2007) with “alright guys” a second time, further affirming that he is focused on establishing a connection between himself and the group. He immediately engages metapragmatic discourse talking about what they’re going to do: “I’m gonna talk to you” signals a participation structure: I talk to you, you respond on my cue. How this is interpreted is culturally variable. Some research indicates that Indigenous youth are taught to be quiet and listen to their elders, that these responses are culturally valued by Indigenous communities (e.g., Biermann 2008). However, Indigeneity is highly variable, and thus Gabe’s framing may signal different participation structures for different youth in the present situation. Gabe indicates what they will do after he talks: “We,” collectively aligned, are going to “play

and pretend”—ostensibly Gabe’s reference to I-STEAM LARP. Gabe’s voice takes a remarkable tonal shift as he tells this to the group, keying a playful tone, and he continues upkeying this tone as he appears to playfully chastise the group for not playing enough. His modal closer “I think” reveals a metapragmatic stance toward his playful discourse: he is aware that he thinks this, suggesting a distinction between what he thinks and what is. Thus, Gabe’s employment of epistemic modality of the metapragmatic “I think” acknowledges that his view may strictly be Gabe’s subjective view and distinct from how other’s actually have experienced the levels of playfulness. Simultaneously, his actions of shifting to a playful key enacts two frames (Bateson, 1972): pretense and actual. Thus, “I think” not only signals a metapragmatic stance aware of the distinction between actual and thinking, but laminated with playful prosody (Goodwin, 2018) it appears to layer an ironic awareness of drawing the distinction between what is actual and what is thought. In other words, Gabe appears to be interactively introducing an interactive pivot linking playfulness and thought through their relations to the actual—webbing together actuality, play, pretense, and thought. These moves are interactively significant because they instantiate in the interactive framing of LARP activities how play and reflection are connected, deliberately, to help develop I-STEAM learning through role-play. A youth responds to Gabe by ratifying his playful evaluative of the group’s level of play and pretend. It is possible the youth was also responding to the epistemic modality of Gabe’s reply and affirming that his experience was shared by that youth as well.

- 783 **Gabe:** **[we're gonna play some [more.**
- 784 **ND:** **[whoo [I got the biggest blackberry.**
- 785 **Gabe:** **After the biggest blackberry gets consumed. So: [(...)**
- 786 **Group:** **[(inaudible)**
- 787 **Gabe:** **eyes and ears over here [guys. (...)**

788 UY: [blackberry fight!
 789 [((Ninja reaches over two people to his right to
 790 Dave))
 791 Dave: ^hahaa^

Gabe contingently responds to a blackberry comment that appears unrelated to his own prior utterance, and then makes a call for reciprocal contingent responsivity, for the youth to give him “eyes and ears.” As Gabe appears to have established an appreciable amount of mutually contingent responsivity with the group, he begins working on developing the phatic connection of playful affect geared toward play activity. To do so, he begins by cuing up shared memory of prior activities.

792 Gabe: So: (..) I wanted to talk to you a little bit about what you guys did on
 793 Monday. <You guys remember when we got to go play on Monday?>
 794 UY: m-hmm
 795 Gabe: [((Gabe shrugs his shoulders))
 796 [Wha- What did we do?
 797 Ninja: We had fun.
 798 Gabe: (.) (smiling) Can we be more #specific#? [(..)
 799 Ninja: [(inaudible)
 800 Gabe: When we were: (.) #being Cedar^#? (..)
 801 UY: yeah:
 802 Gabe: [we had remember^ (.)
 803 UY: [we were a cedar tree
 804 Gabe: when we did, we did the: Grandma Cedar story?
 805 UY: Yeah.
 806 Gabe: Okay, so and then we got to be:: (...) >cedar people< (.) essentially. (.)
 807 right?
 808 Dave: Yeah (.) and I fell over and got covered in leaves.

- 809 **Gabe:** **(((Gabe points at Dave))**
- 810 **[Exactly so**
- 811 **Trent:** **(((Trent raises and drops both hands into grass twice))**
- 812 **[Yeah:: a nurse log**
- 813 **Gabe:** **(((Gabe looks to his notes then looks at group again))**
- 814 **[(..) ^Did you have fun doing that?^**
- 815 **Multiple:** **Yeah**

Across this sequence, we see interactive negotiation of phatic cuing of memory to frame the forthcoming activity. Gabe starts by ostensibly cuing prior shared activity and then working through several micro-cycles of somewhat chained RA to build the phatic connection and foreground relevant aspects the activity substrate for further RA. First, Gabe ostensibly cues up the RO, being “cedar people” during play earlier in the week. He then prompts RA on this RO, framing the RA as a reflection on what was done. Ninja offers a playful reply (perhaps in response to Gabe’s earlier call for more play), and Gabe responds by chaining to this utterance, soliciting more intentional reflection. Gabe’s tone and ostensive marking of his RPs in this sequence suggest that rather than making this space into a play space, it’s a reflective space for organizing future play. In asking for more specificity, Gabe begins to do some of the RA himself, linking to GC story and being cedar people. This activates a memory for two youth, being a nursery log. Dave describes the experience and Trent provides a name, nurse log, that adds another pedagogical layer to their shared reflection. This brief sequence shows how youth can co-construct RA and riff on each other’s contributions to build their own chains of RA. Indeed, this co-constructed RC is the first pedagogical information provided during this activity that goes beyond the phatic concerns of cuing the prior activity.

In response, Gabe initially looks to his notes (possibly consulting the designs he made for this activity) and back up, and then asks if they had fun, taking up the action produced over

several turns as the RO, prompting RA to reflect on whether they had fun doing this, somewhat ironically returning to the theme of fun introduced by Ninja. The ostensive marking of his question, as well as looking up from his notes, indicates Gabe's flexibility in attending to designs for the activity while also remaining contingently responsive to interactive emergence. His question legitimizes having fun as a topic, perhaps as a form of repair to his more skeptical response to Ninja's reference to fun earlier. Its multi-modal ostensive marking (pausing, looking up, tonal shift) indicate that having "fun" is a legitimate ground for reflection, which aligns with Gabe's intention for the present activity, i.e., reflecting on prior activity to develop the substrate for future playful activities.

- 816 **Gabe:** **So I wanna ask** **(((Gabe glances between notes and group))**
- 817 **[ya—**
- 818 **UY:** **yeah**
- 819 **Gabe:** **(((Gabe gesticulates with his right hand to the beat of his words for whole**
- 820 **turn))**
- 821 **[so what some other thing like that is, if you're like (.) being in the role of::**
- 822 **(.) the**
- 823 **Cedar righ::t? (.) you're taking the #perspective of the Cedar# righ:t? (..)**
- 824 **^Why do you think something like that's important^?**
- 825 **((Gabe holds right hand down, palm open and facing group))**
- 826 **UY:** **So we can see (their life cycle?)**
- 827 **Gabe:** **(((Gabe continues holding right hand out, gesticulating to the beat of his**
- 828 **words)) [^So we can see what's going on with the Cedar when they're**
- 829 **going through their life cycle. What's important for them, what's going on**
- 830 **with them^ right?**
- 831 **Group:** **(((Several people point to the sky and Gabe looks up at the sky))**

- 832 **[Eagle. Whoa. ((crosstalk several seconds)) HEY EAGLE! EAGLE:: COME**
- 833 **HE^RE!**
- 834 **Ninja:** **<We offer you a sacrifice!>**

With the substrate of prior play at “being cedar” cued, Gabe begins reflective work on it. In a turn heavily marked with multi-modal ostensive cuing, Gabe invites the group into a collective reflective space. He prepares this space by foregrounding the perspective of cedar. Thus, the shared memory of taking cedar perspective is now transformed into a substrate for RA in the unfolding interaction. Specifically, Gabe prompts RA on the ‘importance’ of taking cedar perspective. Thus, the RA is a particular kind, oriented toward importance—which, given the broader themes of I-STEAM, signifies values, ethics, or axiology. The RR to Gabe’s RP appears to foreground cedar life cycle, and Gabe’s next-turn CC appears to chain to and revoice that response, ratifying it and displaying contingent responsivity to that responder. The substrate of perspective of cedar life has expanded now to “so we can see” what’s “important” in the cedar “life cycle.” The conjunction “so” sets up a motivation, the phrasing “we can see” centers the importance of “we,” presumably the participants, and “see” provides a body-based metaphor for perspective. In short, this phrasing does the reflective discursive work of aligning human perception with cedar values.

There is then an interruption to the conversation trajectory, as an eagle flies over, and Gabe looks up at the eagle as well, and then waits for the group. His silence while waiting signals a contingent responsivity to the group, as well as to the environment which the entire camp is oriented toward, while also tacitly calling for reciprocal responsivity toward him. Gabe then asks for reflection on whether activities succeeded in becoming cedar.

- 835 **Gabe:** **Kay (3s) so did that that (...) <so did that—was that helpful> did you guys**
- 836 **get the feel like you were Cedar at that point?**

- 837 UY: **No (inaudible)**
- 838 Gabe: **(((Gabe points toward speaker))**
- 839 **[That's fair. There is a (((Gabe holds one hand a few inches above the**
- 840 **other))**
- 841 **[spread of difference there,**
- 842 **(((Gabe holds his hands in front of torso and gesticulates with them to the**
- 843 **beat**
- 844 **his words throughout the rest of his turn))**
- 845 **[and that's a really important thing that you still feel like a human being (.**
- 846 **but**
- 847 **you're trying to learn about being in the #perspective# (.) of Cedar, right?**
- 848 **So that's a huge thing.**
- 849 **(((Gabe flips through his notes)) (...)**
- 850 UY: **[(inaudible)**
- 851 Gabe: **(((Gabe resumes gesticulatory pattern as in prior turn))**
- 852 **[Why is this important to do for the land and the water?**
- 853 **(((stops hands then starts))**
- 854 **(.) And and the plants?**
- 855 **(((stops hands then starts))**
- 856 **(.) Why would doing this kind of perspective-taking be important for**
- 857 **them?**
- 858 **(((stops hands)) (((starts hands))**
- 859 **((Gabe waits 21 seconds; there's side chatter but no group discourse))**

In response to the potential helpfulness of learning cedar perspective through play, an unknown youth reflects that he did not feel it was. Gabe acknowledges this standpoint, aligning to the perspective of the youth, and uses this negation to reflect (with heavy ostensive marking) on the challenge of using human perspective to find our way to plant perspective; Gabe places

special emphasis on the word “perspective,” and signals that this is a “huge thing.” He then prompts reflection on the importance of perspective-taking to land, water, and plants. This RP is an example of how some forms of RP embed significant amounts of RA, as it implicitly cues the webbing of land, water, plants and cedar that has repeatedly been explored during I-STEAM camp. Gabe waits 21 seconds for a response, further signaling the significance of “stepping back” and “dwelling” in a collective reflective space at this time. It is possible, as has been evidenced in other areas, that the more RA condensed into a single RP, the more difficulty addressees have coming up with a RR. Side chatter becomes audible, possibly of people trying to process the RP, and Gabe continues to wait. At last he calls on Priya, another adult facilitator.

- 860 **Gabe:** **Priya**
- 861 **Priya:** **^well plants (.) and animals are living too^**
- 862 **((Gabe waits 7 seconds))**
- 863 **Gabe:** **(((Gabe shakes right hand to beat of words))**
- 864 **[^Do we speak the languages of plants and animals at this (((stops hand))**
- 865 **[point?^**
- 866 **Dave:** **yeah, don't talk at all (.) that's >the language<**

Priya offers up the reflective suggestion, with some tonal modalizations of uncertainty, which enhances the sense of a reflective interactive space where conjectures are welcome. Her RR proposes that a ‘life’ links cedar, plants, animals, water, and land. Gabe webs onto this a new reflective pivot that is not directly chained to prior utterances but does continue to foreground aspects of the substrate, plant and animal language. Dave makes an interesting RR to Gabe’s RP, hinting at the human-plant body problem that pervades youth concerns throughout LARP activities over the week (and during the 2016 iteration as well). This RR is not taken up at this time, but its emergence is ostensibly marked by Dave himself as a pre-reflective object (or, potential RO) available for future RA. Gabe webs to the substrate differently again, not chained

to prior utterances but playing forward the reflection on plant and animals perspectives, this time foregrounding “thinking” like them as the RO and reflecting on whether this helps them, again using substantial ostensive marking to emphasize plants and animals.

- 867 **Gabe:** **(((holds both arms out in front of body slightly bowed))**
- 868 **[But if we got in the space where (((holds left hand pointing to his chin))**
- 869 **[we are**
- 870 **(((moves left hand to beat of his words))**
- 871 **[(.) thinking like the [plants and >animals< (..) does this help (.) [them^?**
- 872
- 873 **(((stops hand))** **(((stops**
- 874 **hand))**
- 875 **Therese:** **Yeah, would you wanna be stepped on if you were a plant^ (.) Or an**
- 876 **animal^ If**
- 877 **you think about it (.) maybe you'll be more gentle when you're walking**
- 878 **through the forest. (.) What about all those anemones on the beach**
- 879 **today^ (.) What about the blackberry bushes that got pushed out of the**
- 880 **way and the ferns and the nettles that got pushed aside or picked?**
- 881 **Dave:** **(((Dave points at someone))**
- 882 **[he cut 'em.**
- 883 **UY:** **the the um the nettle—**
- 884 **Therese:** **Do you think that Cedar tree would wanna be cut down or maybe we'll**
- 885 **give tha:nks or (.) an >offering<?**
- 886 **UY:** **Yeah:**

Again, Gabe’s RP continues to reflect significant RA in its asking, and Therese, an adult facilitator, rather than any youth, responds. Orienting to the broader substrate of plant and animal perspective while also zooming in on their desires (“want”), Therese links “thinking about” their perspective to an ethic of care (“gentle”) when interacting with their eco-systems (forest, beach),

and additionally links to shared experiences of the group. Thus, Therese's continuation of Gabe's RP expands the RO to the "importance" of taking cedar perspectives for all plants and animals and offers concrete axiological orientations to ecosystem interactions. It appears as though Therese is expanding Gabe's RP, and Dave treats her last question as a call to respond, offering a concrete RR, ratifying a portion of the social distribution of RA on plant perspective. In this case, the RO is plants encountered earlier; the RA is directed toward their perspective, and the RR "he cut them" indicates that Dave is now thinking about plants, and actions involving them, but still from a human perspective. Therese chains onto Dave's reply, reusing his RR in her call for RA on the cedar's desire and perspective. The action of human cutting cedar is now a RO and Therese's RP is to consider cedar's desire and the ethical response of humans vis-à-vis cedar's desire. This ethical response is affirmed by another young participant. Gabe responds to this reflective discourse by returning to the earlier concern about the difficulty of attuning to plant perspectives.

887 **Gabe:** **So this is important (.)(((leans forward))**
 888 **[because we don't (((pats the grass with right hand))**
 889 **[hear the grass >so well<, we don't**
 890 **understand what the birds are saying >so well<. But if we put ourselves in**
 891 **that space (.) and we got to (.) be: (.) and play the part of these animals**
 892 **and plants (.) and understand where there's being, (((pats grass with right**
 893 **hand)**
 894 **[what they're seeing <how they're seeing**
 895 **it> (.) this is gonna be a big thing that's *particularly important* (.)**
 896 **(((raises right hand and gesticulates to beat of each word))**
 897 **[to help us understand (.)(((rubs right hand in circles in grass))**
 898 **>what makes those places where they're living**
 899 **healthy<(.) (((lifts hand in reverse direction on grass))**

- 900 **[or not healthy (.) right? So: (.) I wanna get (.)**
- 901 **[((bows arms out and makes wide circle))**
- 902 **[us all into, how many are here (.) give me a head count. (...) but we're**
- 903 **going to get into, split up into groups and I want (.) to be (.) #different**
- 904 **plants than Cedar# (.)**
- 905 **We've got we've studied now multiple plants, right? Can anybody name**
- 906 **like at least [((holds up 3 fingers))**
- 907 **[3 plants that we've studied thoroughly?**
- 908 **[((Gabe points at Dave))**
- 909 **[Yes.**
- 910 **Dave: Cedar, um uh, horsetail, um uh (.) nettle!**
- 911 **Priya: You guys can throw out, just throw out names of plants that you**
- 912 **(inaudible)**
- 913 **ND: raspberry pomegranate**
- 914 **UY: Nettle, cedar, ((inaudible)**
- 915 **Gabe: ((alright, you guys have learned a lot about different plants.**

Gabe offers his own extensive and highly marked reflections (RCs) on the “importance” of taking plant perspectives, making explicit axiological motivations for doing LARP. He links the importance of “seeing” their perspective to making their environments healthy. Thus, the substrate of prior activities is interactively developed here into an axiological motivation for the “importance” of I-STEAM LARP. Gabe culminates in explicitly telling them what they’re going to do in the next activity, framing and launching the activity ahead. This activity expands on prior activities by taking new plant perspectives other than cedar, with the axiological motivation to these exercises foregrounded.

The analysis here shows how much interactive work goes into launching and framing, establishing contingent relationality in the phatic connection, maintaining the mutuality and

reciprocity of this contingent phatic connection in order to layer on reflective discourses oriented toward cuing past experiences as objects for collective reflection in the present interaction. Only through many interactive turns, and negotiating interruptions as opportunities to interactively signal contingent responsivity, is Gabe able to cue up past shared experiences, reflect on them, and reflect on those reflections (RD chaining) in order to set up the framing for the forthcoming activity. Relaying across macro-cycles, including across activity scale macro-cycles, even when designed for, still requires interactive work to be accomplished.

7.30.15 Thursday LARP Priya Small Group

This activity took place on the fourth day of camp and the third day of LARP. The assignment was for the group to pick a new plant relative, study it by reviewing a card containing I-STEAM relevant information about it, find it in the actual environment, and then role-play being that plant. This transcript follows the sub-group of one adult facilitator (Priya) and three youth comprising a mixed age group: Alvin (youngest), Regan (oldest), and Jake (middle). While the framing of the activity took several minutes of negotiation, considerable RA was set in motion as the group established their initial phatic connection. Eventually the group agreed to split, with Alvin as blackberry and the rest as salmonberries. Across the transcribed portion of the episode, which ran for 30 minutes beyond transcription, RD chained and webbed together blackberry, salmonberry, sun, shade, human similitude, life cycle, seedling, growth, and energy.

This episode demonstrates how the interactive learning of the participation framework for a given activity was interwoven with the onto-epistemic and axiological orientations in enacting the designs of I-STEAM LARP. These designs had specific learning outcomes in mind, and facilitators worked with students on how to best realize them given the constraints and affordances of their shared situation. In the first activity chunk below, the group appears to have

succeeded in agreeing on which plant relatives they will enact during the activity and begin moving their bodies to a place where they would have close access to the boundary between the field and the forest during the activity. A close look considers how the interactive dynamics of RA were utilized by the interactants as resources for holding the interaction together and mutually determining its interactive substrate.

- 916 ((Priya is facing Jake and Alvin, each standing on either side of her in an
917 open-L))
- 918 Priya: Do we wanna be our plant relative, or do we want to be something else?
- 919 Alvin: <Something else>
- 920 Priya: Something else? You want me to go get one of those sheets?
- 921 Alvin: #>Something el::se<#
- 922 ((Priya walks toward Gabe))
- 923 Priya: [I'll get one of these.
- 924 [((Gabe hands her a packet))
- 925 ((Priya returns to face Jake and Alvin, and Regan who is crouched on the
926 ground behind and facing them, examining the land with her hands,
927 forming an oddly shaped four-person o-space))
- 928 Priya: [Okay
- 929 Alvin: [I already know what I want to be.
- 930 Priya: What?
- 931 Alvin: Blackberry bush
- 932 Priya: [((shuffles through packet, looking down at sheets of paper with diagrams
933 of PNW plant relatives, continues to flip through packet))
- 934 [U:m how about salmonberry?
- 935 Alvin: no
- 936 Priya: [How 'bout—
- 937 Jake: [Salmonberries are good

938 Alvin: **Blackberry bush!**

939 Priya: **(((Priya holds papers up))**

940 **[Well let's do one of these >^nettle^< (.]**

941 Jake: **Well we're always blackberry bush.**

942 Priya: **What's your plant relative?**

943 Alvin: **(.) Snowberry**

944 Priya: **Snowberry? (.) Ooh yarrow, I saw some of that today (.) >salmonberry:<**

945 Regan: I got

946 **(((Alvin walks backward and controlled falls to the ground on his back))**

947 Priya: **[Fireweed (.) horsetail [(.) hmm**

948 **(((Regan stands up and walks to group joining o-**

949 **space))**

950 Priya: **Hey you know salmonberry (.) >there's a berry< <do you wanna do**

951 **salmonberry?> ((looks to Alvin)) You wanna do blackberry?**

952 Alvin: **Blackberry**

953 Priya: **((looks to Jake and Regan)) Do you guys wanna do Blackberry?**

954 Jake: **I wanna be salmonberry**

955 Alvin: **[I wanna be both**

956 Regan: **[Salmonberry**

957 Alvin: **I can poke people now!**

958 Priya: **You know (.)** **(((turns away from group, walks to Gabe, returns packet to**

959 **him))**

960 **[salmonberries have spikes too (.)**

961 Alvin: **where are all: the salmonberries?**

962 Priya: **Here (.) <you can be blackberry, too> (.) come on.**

963 **(((Alvin gets up and the group starts walking together for 50s))**

The recording begins with Priya asking the group what plant they will be during their forthcoming LARP scaffolding activity. She gives two options, one specific, the other open, and

Alvin quickly seizes on the second option to propose being “blackberry bush”. Blackberry has a questionable standing, as it is not a keystone plant of the camp. Jake objects that they are “always blackberry bush”, and he and Regan choose salmonberry, which is Priya’s proposal. Alvin quickly replies that he wants to “be both”. He exclaims that he “can poke people now!” and Priya pedagogically notes that salmonberries have spikes too. Alvin chains to the object of Priya’s proposed RA and reflects on it further, asking where the salmonberries are in their current environment, indexing the immediate relation of their bodies to their surroundings. Priya responds by affirming Alvin’s request to be blackberry and leading the group on a short walk along the edge of the field bordering the forest.

In total, 16 RAs are coded here: 5 internally on single turns and 11 distributed across RP-RR interactions.⁵ Ten RAs are chained onto prior discourse, forming 11 micro-cycles, the most extensive chaining being 9 micro-cycles. The chaining of this macro-cycle is worth diagramming, given how it appears to drive the interaction toward determining what plant to enact during the activity.

1-RP: “Do we wanna be our plant relative, or do we want to be something else?”

1-RR: “<Something else>”

2-Cnt: “[I already know what I want to be.]”

2-RP: “What?”

2-RR: “Blackberry bush”

3-RC: “Well we're always blackberry bush.”

4-RP: “You wanna do blackberry?”

4-RR: “Blackberry” 5-RP: “Do you guys wanna do Blackberry?”

5-RR: “I wanna be salmonberry”

6-RC: “[I wanna be both”

7-RC: “I can poke people now!”

8-RC: “You know (.)[salmonberries have spikes too (..)”

9-RP: “Where are all the salmonberries?”

To an extent some of this chaining is repetitive. A more streamlined flow of the macro-cycle goes might be:

1-“Do we wanna be our plant relative, or do we want to be something else?”

1-“Blackberry”

1-“I wanna be salmonberry”

2-“[I wanna be both”

3-“I can poke people now!”

4-“You know (.)[salmonberries have spikes too (..)”

5-“Where are all the salmonberries?”

However, repetition is a crucial interaction resource that different interactants can use to advocate for their interests, and thus any condensation of progress must be wary of reducing away complex interactions needed to arrive at a particular understanding. Either diagram, in any case, makes evident how through this chaining process, in which interactions between Priya and Alvin drive much of the work, the group determines the initial interactive substrate of the interaction: the webbed relations of the salmonberries and blackberries. They are already engaging pedagogical communications germane to I-STEAM LARP learning outcomes. From a LARP standpoint, they have established the activity rule that a group and even a single player can embody multiple plants, affording multiple plant perspectives toward their eco-relations. From an I-STEAM standpoint, the substrates of salmonberries and blackberries are linked

through shared embodiments and affects: they both have the embodied capacity to poke other beings with their spikes. Thus, these chains of RD not only develop the interactive substrate for the activity, but they perform operations on it that expand it.

In addition to building onto-epistemological webs through chaining, the group is also linking web nodes across several other keystone plant relatives in their PNW ecosystem (that could also be LARP characters encountered in a LARP playworld): nettle, snowberry, yarrow, fireweed, and horsetail. None of these were chained into further RD, but their naming and ostensible links to the printed sheets means that they have been introduced as pre-reflective objects subject to further chained RD and onto-epistemic webbing (which is why I code them in purple as CCs).

A closer look at how RA was an interactive resource in the development of the interactive substrate helps clarify how these chains and webs were drawn. Sixteen of the 21 PC and CC signals that I coded were emitted by Priya. This appears consistent with Priya's positionality as the adult charged with facilitating the activity, positioned by Gabe—the activity designer—to do so, and as holder of printed artefacts that could help mediate parts of the activity. Priya gives this mediator considerable interactive attention; ten of her connective and continuance moves make the artifact interactively visible. Given Priya's positionality, it is unsurprising that she issues 10 of the 11 RPs. The phatic attention she gave the printed sheets shows up in half of these RP bids. All but one of the RRs were given by students, with Alvin giving 7 of them. Alvin stands out for how he appears in the distribution of coded aspects of RA. Along with responding to Priya's RPs the most frequently, he is the only person to code for a CC besides Priya, when he wanted to orient Priya away from the sheets of plant relatives and toward what plant he had already determined to be. Alvin also offers two of the four reflexive communications (RCs), both offered

consecutively as he achieves his goal of being blackberry after considerable negotiation. And he issues the only RP besides Priya, prompting attention to salmonberry's emplacement. Given how counts of Alvin's coded interactive moves stand out, it's worthwhile to look more closely at what is happening with Alvin, which I will do below after analyzing the remainder of the transcript.

Formally Starting the Activity

The following chunk displays two embedded macro-cycles. The first attends to the joint question of where the group should sit, sun or shade, which Priya pivots into a reflection on the sun/shade relations of salmonberries and blackberries. In the second macro-cycle, Priya appears to engage in formally positioning the group inside the playworld frame, marking the official start of the activity assignment. Like other similar activities, they start out as salmonberry and blackberry seeds and navigate a life cycle. It is important to observe that while this appears to be ordered around building the phatic connection to the interactive substrate, the frame of I-STEAM learning has already been in motion, and a considerable amount of work during the framing period plays forward into and shapes the mutual orientation to the playworld activity.

- 964 **(((Priya looks back at Gabe))**
- 965 **Priya:** **[^Should I (.) take another one or^—I guess everyone's good. Let's go (.)**
- 966 **everyone's fine.**
- 967 **((Priya leads group in walking along the edge of the open field next to the**
- 968 **forest, away from the other small groups))**
- 969 **Regan:** **can we stay in the sha:de?**
- 970 **Priya:** **Yeah**
- 971 **Alvin:** **That's the (inaudible) place for me up there**
- 972 **Priya:** **Where?**
- 973 **Alvin:** **Blackberries like sun**

- 974 Priya: Blackberries like sun? (.) How 'bout salmonberries, do salmonberries like
 975 sun?
- 976 Regan: um [(.) not really
- 977 Jake: [They like shade
- 978 Priya: They like shade? ^Hmm^
- 979 Alvin: I think they like sun so they can grow.
- 980 Priya: ^Sun so they can grow^ How 'bout (.) can you be: (.) [can you have both?
- 981 Jake: [blackberries are
 982 mostly under the shade.
- 983 Priya: Can you have >both sun and shade<?
- 984 Alvin: Mm-hmm (affirmative)
- 985 Jake: yeah
- 986 Priya: Yeah?
- 987 Jake: [you could be like (inaudible)...
- 988 Alvin: [like you can be (.)][((standing in the sunlight, Alvin steps a foot into a tree
 989 shadow))
- 990 [like here like my foot's in the shade (.) <but the rest of
 991 my body is in
 992 the sun> [((Alvin steps both feet into the shade))
 993 or [it's in the shade and some of it in the sun. [(inaudible)
- 994 Priya: [Yeah? [Hmm
- 995 Priya: So what if you start out as just like a little [((sits down on grass in shade
 996 near boundary
 997 between field and thick flora))
 998 [baby salmonberry where you're
 999 like this big?
 1000 [(.) or a little baby salmonberry

- 1001 **Multiple:** (((Regan and Jake both sit down side by side forming a shaded o-space
 1002 with Priya))
 1003 ((Regan keeps upper body upright and Jake lays upper body on ground
 1004 with knees pointed up))
 1005 **Priya:** [an:d <you're just a tiny little baby>
 1006 **Alvin:** (((As he makes a nonvocalic playful noise that sounds like "weee", Alvin
 1007 sits down and falls backwards about 10 feet behind Regan and Jake, in
 1008 the sun, and then curls up into fetal position and tips to his side))
 1009 **Priya:** (((looks down at notes on salmonberry page))
 1010 [an::d (.) you start off as what (.) <a seed>?
 1011 **Regan:** uh huh
 1012 **Priya:** Yeah, you start off as a [see:d and you sprou:t (.)=
 1013 **Alvin:** [I'm gonna be a seed!=
 1014 =(((Alvin lifts upper body up from seed position, maintaining lower body
 1015 in fetal position))
 1016 **Priya:** =[an::d let's say you sprout like right in like this >sunny slash shady<
 1017 spot. *It's like both sunny and shady.* And then you start growing a little
 1018 bit and you're like >really young<

The group walks until they find a spot on the edge of the field bordering the forest. As they near the spot Regan requests to sit in the shade, foregrounding place and location in the interactive framework. Pertinent to the theme of location, and potentially pivoting on Regan's interactive attention to where they should sit their bodies for the activity, Alvin indicates that he's located a place up in the forest that is "for me". When Priya asks for clarification on location, Alvin webs this to the blackberry-sun relation, presumably clarifying that he was pointing to a sunny area where blackberries were growing, and also drawing a clarifying parallel between "place for me" and "blackberries like sun", to wit, he is in play-frame as a blackberry.

Priya responds by marking Alvin's assertion with contingency and openness to further consideration (coded as a CC), and then expands the question to salmonberries, bidding Jaden and Regan to contribute. They, in turn, indicate that salmonberries prefer the shade, and Priya marks their response in a similar tone as she marked Alvin's, drawing a juxtaposition of 'blackberries like sun' and 'salmonberries like shade'. Priya's remark after this, "hmm" appears to be a vocalic and nonverbal prompt to reflect on this juxtaposition, illustrating how RPs can enact RA with minimal semiotic input if interpreted as such interactively. Alvin evinces such interactive interpretation, appearing to respond to this apparent distinction by clarifying the motivation for blackberries, that they like sun so they can grow. Priya marks this as well, though her tone now sounds less questioning than her prior two revoiced markings. Priya then asks if it is possible to have both, using considerable ostensive marking, producing an RP that itself makes a significant reflective move: rather than seeing the two positions as oppositional, perhaps both are true. Before she finishes her RP, Jake gives an RC to the earlier position that blackberries like sun, arguing that "blackberries are mostly under the shade". Priya reiterates her RP, and Alvin and Jake both agree that having both sun and shade is possible. Priya then makes a one-word prompt to reflect further, and both Alvin and Jake start answering at the same time, and then Jake stops as Alvin completes his RR. Alvin utilizes his body and the sun and shade of the actual place of their interaction, displaying how his body can be in both the shade and the sun at the same time. This short strip of interaction illustrates how Priya utilizes RA to help negotiate a third position between two opposing positions produced by two students.

Priya then initiates the in-frame role-play activity with four micro-cycle initiating RPs that comprise a single macro-cycle enveloping multiple layers: (1) she sits down, signaling that they are done walking and ready to anchor physically into the activity; (2) she shifts pronouns

from talking about plants in the third-person to addressing the students in the second-person as plants; (3) she pivots on the conversation about place, sun, and shade by chaining onto Alvin's RR and segues into the in-frame activity. Thus, Priya's move also exhibits how facilitators can create pivots from out-of-frame actions to launch into in-frame actions, particularly by chaining onto the discourses initiated by the students and converting the out-of-frame RAs into in-frame ROs.

As she narratively positions the group as baby salmonberries, emphasizing baby by saying it three times in her RP, Regan and Jake sit down in the shade facing Priya to form a small o-space between them. Alvin sits about ten feet behind Regan and Jake, in the sun, facing Priya, while making a "weee" sound and curling up into a fetal position as Priya emphasizes "baby." In short, only Alvin appears to already be reflectively embodying Priya's narrative prompting. At this point, the group is comprised of two transactional segments: between Priya and Alvin, who are far apart but already adopting the play layer, and Priya and Regan and Jake who are close together demarcating a clear o-space, yet not entirely aligned with the play frame. The 3 layers seen in other LARP activities is interactively marked here as well in: (1) inside the play frame marked by equating youth as "you" and "salmonberry"; (2) on the rim of the frame signaled by narration play-planning talk; (3) outside the play frame and inside the I-STEAM content learning frame, activating mutual orientation to salmonberry.

After establishing the initial frame of "baby salmonberry," Priya layers on the idea that salmonberries start as seeds. Alvin ratifies Priya's implicit RP to embody with embodied responses, whereas Regan and Jake wait about 60 lines (not shown here) before they start enacting salmonberry in-frame. Alvin's quick adoption may harness multiple resources: (1) This is the third day this week they are doing this kind of activity and he's practiced it before with the

youngest group, which displayed the highest intensity of affective play; (2) Through these prior activities, he's learned the contextualization cues (pronoun shifts) and embodiment cues which correlate with particular narrations, and thus knows how to recognize RPs encoded in narration and how to offer RRs with his body; (3) in building the phatic connection of this activity, Alvin demonstrated his willingness to respond quickly and appropriately to Priya's RPs.

Priya then embeds an explicit prompt that likely functions to ensure the group is still mutually oriented to Priya's extended prompt (85-86), illustrating again how interactants can use RA to maintain the mutual orientation of the interactive framework, and not just to transform the substrate.⁴ Priya begins laminating onto the word "baby" the word "seed," linking a more common I-STEAM frame for thinking about plant life cycles. Thus, the RP itself does the primary RA, seeking ratification from the respondents, which Regan provides. Priya then chains to this position and layers on the next sequential move in the salmonberry life cycle: sprouting. As she does this, Alvin responds to her prompt to be a seed with first-person narration while embodying the seed icon he had practiced during LARP two days earlier.⁵ Priya continues, overlapping to some extent with Alvin, as she presents the next prompt to reflect upon: sprouting in a ">sunny slash shady< spot" and beginning to grow "a little bit".

Priya's multi-turn macro-RP here folds together several layers in one move. As before, she plays forward the layers of narrating on the rim of the role-play frame, positioning participants in the frame with second person identifications with salmonberry, and developing I-STEAM themes that bounds that regulate how the playworld action unfolds. Furthermore, she continues to discursively chain her prompt to the ongoing interactive substrate and she continues to utilize the sun/shade pivot to hold together out-of-frame interactive decisions and in-frame narrative and embodied developments.

While the framing of Priya's macro-RP does considerable RA, it all appears tonally as a buildup to formally prompting the group to reflect on some aspect of the substrate she is loading across her turns. Indeed, I analytically cut this chunk here because Priya's next move actually embeds another supplementary macro-cycle that develops a pre-understanding that she likely believes would be pedagogically helpful to framing her primary prompt. The formal prompting to transform the I-STEAM relevant content of the substrate doesn't occur until later, after Priya has drawn a link between salmonberry "babies" and human babies and their shared need for energy (and thus connections to energy sources) to grow.

- 1019 Priya: **What do you—when you're like really young—(.) has anyone ever hung**
 1020 **out around babies before?**
- 1021 Regan: **Uh huh**
- 1022 Alvin: **I've seen a [baby=**
 1023 Jake: **[yeah**
- 1024 Alvin: **=[before**
- 1025 Priya: **=[yeah have you ever hung [out with a baby?**
- 1026 Alvin: **[I've seen a baby that was (.) lived for like (.)**
 1027 **maybe (...) two weeks or one.**
- 1028 Priya: **Oh (.) that's**
- 1029 Alvin: **Or maybe just (.) or maybe just 3 days old.**
- 1030 Priya: **So you've seen like a little th-baby, what do babies do?**
- 1031 Regan: **Cry**
- 1032 Alvin: **Cry**
- 1033 Priya: **Yeah, what else?**
- 1034 Jake: **<cry crawl around>**
- 1035 Priya: **Crawl around—what if they can't even crawl yet?**
- 1036 Regan: **They just like [(.) they don't do much.**
- 1037 Alvin: **[they just like sit there**

- 1038 Regan: They just like [cry and...
- 1039 Alvin: [they just like sit there and cry
- 1040 Regan: be-uh fed=
- 1041 Alvin: =they just [sit there and cry
- 1042 Priya: [FED
- 1043 Alvin: I know why they cry=
- 1044 Priya: =why?
- 1045 [((Priya looks over to far right of group where Rose approaches to begin
- 1046 filming))
- 1047 Alvin: [Because they think it's unfair that everybody else older than them can
- 1048 walk but they
- 1049 can't
- 1050 Priya: So maybe they get like >frustrated<
- 1051 Jake: [and jealous
- 1052 Alvin: [they can't walk but other people can
- 1053 Priya: But Regan you said that they also get fed a lot too. [((turns to Rose))
- 1054 [Babies—you've had a
- 1055 baby, babies
- 1056 eat >a lot<. Babies need—<what do we get> from our food?
- 1057 Regan: um:: (.)
- 1058 Alvin: <milk>=
- 1059 Jake: =protein
- 1060 Priya: <yeah we get milk>, we get protei:n
- 1061 Regan: Carbs^
- 1062 Priya: Carbs, we get lots of good energy, right? We need all this energy. So if I'm
- 1063 like a little >baby salmonberry< I need (.) a lot of energy, right^? Lots of
- 1064 energy.

Priya initiates an embedded macro-cycle of the substrate with a question formatted, ostensibly marked turn involving two self-interruptions and a short pause, prompting the group to collective RA. All three young participants respond. Priya repeats her RP nearly verbatim, suggesting that the RA she was seeking was more than simple existential recollection of a fact, but a phenomenological recollection of the lived experience. Alvin ratifies this possible significance by beginning to reflect on a specific memory, indicated by his desire to pin down the precise age of the baby he hung out with. Priya then chains a RP to this RR to reflect on what “babies do”. Again, receiving participation from all participants, Priya continues to chain RPs that bring the group closer to a parallel between salmonberry seeds and human babies, until Regan adds that babies get fed. Priya jumps into what sounds like competing and nearly overlapping turns between Alvin and Regan to emphatically mark Regan’s RR. After a brief interlude in which Alvin initiates a reflection on why babies cry, which generates two chained micro-cycles of RC, Priya returns to Regan’s contribution to reflect on babies getting fed. Indeed, the past participle “fed” appears crucial to Priya’s formulation, given how she retains the participle within the verbal construction “get fed”. This is opposed to “babies eat,” which would omit the relational connection to a person feeding a baby, or “caregivers feed babies,” which might shift focus to the caregiver as the subject of the action. Instead, the focus is on the baby’s perspective in the relational dynamic. The reflective work Priya does to hold this perspective together draws on an interactively produced resource, Regan’s utterance introducing the verbal construction of being or getting fed, while also using interactive resources of repetition, contingency marking, and ostensive marking (to foreground this particular construction of ‘babies get fed.’)

Additionally, in the course of this reflective turn, Priya contingently integrates Rose, an Indigenous mother who has just joined the group to film it. It is possible that acknowledging Rose affords Priya a pivot that recognizes Rose's arrival while also allowing Priya to externally mediate the cognitive link between baby and caregiver that is culturally marked in an Indigenous context. Overall, this appears to lend power to Priya's analogy between salmonberry seed babies and human babies, which appears to align with the overall I-STEAM ethos of determining common, non-anthropomorphic grounds between human and non-human relatives. While none of this was marked explicitly, and thus not subject to more intentional reflection, it nonetheless demonstrates how contingent relationality moves can mark pre-reflective objects for potential reflection in forthcoming co-operative action.

Priya's adds the marked layer that babies "eat >a lot<" (which I code as an RC chained to the Regan's initial reply) and Priya appears to begin to develop this into an affective relation before self-interrupting (again, a visible marker of invisible-mental RA), to ask what "we get" from "our food". Given the contextual framing, there's some ambiguity built into this wording that affords a complex layering of multiple frames (Eisenberg, 1984). "We" can mean "we as babies," "we as us people right here," "we in our salmonberry characters." This ambiguity allows it to take on any and all these meanings. Again, all three students reply, affirming that Priya is navigating this complex interactive substrate while retaining contingent relationality with all participants. Furthermore, she chains an RC to all three responses by linking them to their common ground as "energy". Priya's RC is pedagogical, with an attuned audience, in part by virtue of her ability to utilize chains of RD to elicit participation from everyone and index everyone in the functionally ambiguous uses of "we" to hold together several layers at once. In saying "we need all this energy" Priya makes available for RA several links: we as humans,

human babies, and salmonberry seeds all need energy. In short, an affective relation linking human to more-than-human need for energy holds the group together not only in relation to each other, but also in the playworld frame (introducing a key element in the playworld) and in the axiological and onto-epistemological framing of the I-STEAM.

While the activity carries on for another 30 minutes, I end IA here, as this is sufficient to illustrate how the group draws on numerous interactive resources to begin transforming the interactive substrate through discursive chaining and webbing across multiple micro and macro-cycles of RA conjoined and intertwined through multiple laminations and pedagogical communications. I will now provide a summary analysis of the interactive substrate, Priya's pedagogical moves, and Alvin's responsivity as a learner who toggles between the center of activity to the periphery in relation to the pedagogical communications and RAs of the interaction.

Interactive Substrate

The interactive framework comprised of an adult educator and three young participant students, tasked with continuing LARP scaffolding exercises by choosing a focal plant of the camp, anchoring in a spot on a field neighboring a forest including that plant, and role-playing that plant's life cycle and eco-relations. Thus, the group needed to negotiate which plant to be and where to place their bodies during the activity. The process of determining the substrate plant itself was sinuous, with the group ultimately agreeing to both salmonberry and blackberry, thus already pushing on the boundaries of the pre-defined playworld. Furthermore, the interaction made Priya's role clear to lead in prompting the trajectory of co-operative action, pivoting on particular moves made by the young participants and marking them for further co-operative action. Alvin, however, appeared to challenge and problematize a straightforward

hierarchy, often responding first to Priya and not infrequently disrupting the projectible adjacent pair structuring of the activity to interject his own trajectories for the activity. The evolution of the interactive substrate can be summarized as follows:

- 1) The group agrees to be blackberry and salmonberry, determining a playworld rule that it's ok to be more than one plant at a time, more readily affording a webbing of relations across multiple plant relatives.
- 2) The group learns that both blackberry and salmonberry have common affective capacities to "poke" due to their common embodiment of "spikes."
- 3) The group agrees to sit in an area with sun and shade, determining that blackberries and salmonberries like sun and shade, pivoting between the place of their actual bodies and place of their playworld in which their actual bodies will pivot to become plants.
- 4) As the group sits down, opening two transactional segments (Priya, Regan, and Jake; Priya and Alvin), Priya begins narrating on the rim of the frame how they will be positioned in the playworld as "salmonberry babies." Only Alvin initially adopts the adjacent pair structure of narrative (RP) and embody (RR).
- 5) Priya layers on that salmonberry babies are in fact "seeds" and that these seeds "sprout" in the right balance of sun and shade. However, to explore how this first transformation of the plant substrate occurs, Priya prompts a reflective chain webbing human babies to salmonberry seeds.
- 6) Rose, an Indigenous mother familiar to the group, joins the group to film it, and Rose's relation to her own child is marked by Priya as a pre-reflective object for potential future RA.

- 7) Alvin interjects RA on why babies cry, surfacing reflections on frustration and jealousy about their inability to walk, marking another pre-reflective object for potential RA in the analogy between human babies and plants in general.
- 8) Regan contributes that babies get “fed,” which Priya revoices multiple times, marking it for further RA. Priya then reflectively links human food to energy, which she links back to salmonberry growth 8 lines after the transcript here ends. She also aligns the interactants as humans, human babies, and salmonberry seeds through her reflective moves.

Priya’s Pedagogy: Micro-Practices of Reflective Discourse

Priya’s RD moves here are remarkable. Rather than telling the group what to be, she asks them. Recognizing some tension and disagreement about which plant to be, she attempts to mediate the negotiation by referring to a pre-designed artifact. However, quickly attuning to how little her artifact-based suggestions get responses, she discursively chains to the responses she does get. From this, the group makes two discoveries, one for the LARP activity framework and one for I-STEAM learning: (1) the group can inhabit multiple plant relatives at the same time; (2) salmonberries and blackberries share an embodied affective capacity to “poke.” This progress is built primarily through how Priya chains her RPs to participant generated responses. Priya continues to display high contingent responsiveness as the group negotiates where to set their bodies. An ever-present affordance of learning about an ecosystem within that ecosystem is the potential to pivot on the ecosystem to develop a learning activity. Here, Priya is able to pivot on what appears to Alvin’s alignment with blackberry identity and place relations to position the group in-frame as their plant relatives and reflect yet again on their shared affective relations, this time to sun and shade. Thus, even the RA of establishing the phatic connection and

contingent relationality of the forthcoming activity makes substantive contributions to the development of the interactive substrate.

As Priya formally launches the group into the activity, setting the frame by prompting them in-character of their playworld, initially as salmonberry babies (later she will expand it to allow Alvin to also be blackberry), Priya's reflective prompting consolidates considerable RA as well. She positions the group in the life cycle of the salmonberry, draws an implicit link between salmonberry seeds and human babies, then explicitly pivots on that link to draw out an affective relation they all share (the interactants, human babies, salmonberry seeds), in order to grow. Having already facilitated an activity earlier in the week in which she used narrations as RPs for interactants to reflectively respond with their bodies, Priya engages this interactive dynamic again, a move quickly ratified by Alvin and eventually ratified by all participants. As Priya continues this familiar style of engaging RA by distributing RPs across narrations that afford RRs via embodiments, she interrupts herself. Rather than narrate how a seed sprouts, she hinges on this action to reflect. She could have simply told the group, but instead she converted this action to a teachable moment, i.e., an opportunity to engage more deliberate reflection. Furthermore, she embedded a reflection aligning human babies, the human interactants, the salmonberries they were enacting, and actual salmonberries. In total, I identify three reflective objects that Priya used to prompt the group to "step back" and "dwell" on a particular perspective: (1) plants relations to sun/shade; (2) affective commonalities of energy needs and food relations linking humans and plants; (3) salmonberry seed energy requirements for growth to sprout. Across this entire 30 minute episode, I counted at least ten clear interactive moves to "step back" and dwell reflectively on a particular RO.

Two important observations with theoretical implications about RA are significant here. First, as argued earlier, theoretically any strip of communication can be coded for its autonomic-reflective aspects. Indeed, nearly all of the phatic connecting and contingency signaling interactions transpiring during the framing phase at the start of this activity involve micro-interactions of reflection. A quick glance at the codes shows a sea of yellow-blue and green that collectively indicate RA. This episode exhibits higher frequencies (occurrences/word; occurrences/line) of both phatic marking and RA than any other episode that I coded (6 total). Second, as argued earlier, a theoretical distinction exists between autonomic reflection and intentional reflection. Indeed, intentional reflection, closely related to “thinking about,” is arguably what practitioners tend to think of when they think of reflection, and several moves here clearly indicate that Priya is discursively prompting the group to “step back” and think about a particular RO. The data here evidences that these two frames of reflection are not in tension with each other, but seamlessly laminated onto each other as ever-present resources for developing the interactive substrate. Even more, the data suggests that rather being than a binary, autonomic and intentional co-exist in varying degrees, creating a range of possible reflective actions. For example, prompting embodied reflections through narration appears to involve largely implicit prompts, cued by practices developed across the week. These embodied replies may be reflexively chained to form subsequent embodied replies, or they may become ROs for subsequent RPs. The way such prompting is enacted during LARP activities suggests that interactively it functions largely at an autonomic level, moving the activity along but not necessarily entailing substantial intentional reflection in of itself. When more deliberate reflection does occur, it often appears discursively mediated. In other words, looking across Priya’s turns here, and the LARP data more broadly, large swaths of RC (green highlighting)

appear as a facilitator engages in extensive reflection on what the interaction has produced. This makes sense given how spoken language has developed such nuance, precision, and vastness as a semiotic field. This does not displace embodiment as a semiotic field, but rather the data here evidences how embodiments are part of an array of multi-modal practices that help develop ever-more sophisticated ways of discursively thinking about eco-perspectives and relations of plants.

The effects of Priya's pedagogical moves are crucial. After all, pedagogy without learning is arguably not pedagogy at all. Tracking how Alvin—the youngest member of the group and somewhat on a social periphery with respect to the siblings Regan and Jake—negotiates his participation in the activity helps reveal the efficacy of Priya's pedagogical moves.

Zoom In: Alvin's Role in the Group

Alvin's interactive style is remarkable throughout these strips of interaction. From the beginning, Alvin often responds first to Priya's RPs. At the very beginning, Priya responds to his first RR by proposing reflecting on the options provided in the artifact. Alvin does not want this, and when Priya returns with the artifact, Alvin responds that he "already" knows what he wants to be, positioning Priya with a continuance to issue an RP inquiring his knowledge. However, Priya does not chain right away onto his RR that that he wants to be blackberry. Instead she and the other two group members appear to move toward salmonberry, which Priya identifies in the printed artifact and proposes to the group. As Priya identifies a web of possibilities from the sheets, Alvin appears to physically disengage, stepping out of the f-formation and falling to the ground. Perhaps cognizant of this phatic disruption, Priya chains to his earlier decision to be blackberry, signaling a contingent responsivity to his desire to be blackberry. Gaining ratification of the move he persisted toward from the start, Alvin gleefully decides he will be both blackberry and salmonberry, proposing an expansion of the activity participation framework, and

he celebrates, with an in-frame pronoun, his capacity to poke people. Priya seizes on his eagerness to poke by reflectively linking blackberry and salmonberry via this shared affective capacity each embodies. Alvin appears responsive to this reflective discourse (RD) chaining and asks where they can find salmonberries. This is the first time a student makes a RP, presumably seeking to locate salmonberries in his immediate environment and possibly to reflect further on Priya's RC that salmonberries have spikes. Priya responds by inviting him to follow the group, leaving open the possibility that her response is a contingently responsive move to take him physically to a place on the edge of the field that has salmonberry. Alvin's responses to how the activity substrate is framed and negotiated helps to expand the framework for LARP (a player can be two plants), which in turn opens up the interactive potentials to reflect on shared affective links between different plant relatives, augmenting the I-STEAM orientation of the role-play activity.

Alvin's persistence in retaining a connection to blackberry carries forward as the group chooses where to sit down. He prompts the group to reflect on location of plants, foregrounding the plants' place-relations, and his suggestion that blackberries prefer sun, a claim contested by Jake, motivates Priya to seek a solution that affords both perspectives. Alvin quickly adopts this stance and uses his body's place-relation to mediate how he imagines the affective relation between blackberry/salmonberry to sun/shade. Across the phatic process of positioning the group to co-operatively act on the activity substrate, Alvin appears to adopt unorthodox positions, insofar as he continually appears to be separate in both ideas and bodily position to the group.

Alvin's persistence to retain his apparently unorthodox agentic orientations to the activity substrate continues after the group has officially started imagining their embodied emplacements in the plant playworld. For example, when discussing babies, after Alvin has provided a lengthy

reflection on a memory of meeting a baby, partially satisfying Priya's prompt to reflect on such a memory, Alvin proposes to know why babies cry. This exchange is noteworthy for how it illustrates power dynamics and beliefs about participation framework for interactively shaping the emergence of RA. Alvin has an idea of why babies cry and offers a CC positioning Priya to give him the 'floor' to speak to the group. Why does Alvin make a bid rather than simply say what he knows? Alvin is often involved in overlapping talk with the other participants, and this may be a bid to be heard so that he has a clearly marked interactive space to speak without needing to navigate overlapping speech.

This particular situation, with its endogenous calls for a strategy to be heard in a particular way, shapes the emergence of RA, thus illustrating yet another source of variation in how RA appears. Alvin has a reflective thought to share. It is unprompted, and yet he marks it as valuable enough that he ensures he has received joint attention to his speech before sharing it. He is not attempting to distribute production of the reflective thought to other people other than bidding for their attention. He elicits a transactional RP from Priya (by which she makes an RP strictly for the progressivity of the conversation), and then he is free to speak uninterrupted. Priya is positioned as the adult leader of the group, and thus has significant interactive power. Her transactional RP signals to all people present that Alvin should have the interactive space to chain his reflection to a common observation shared by all three students (babies cry), instead of pushing forward to her wish to chain onto feeding babies. Alvin used the interactional strategy of making a bid earlier in the activity, and it seems functional in his current interactional navigation. As a result, he gets a fully un-interrupted turn to share his entire reflection. Thus, collective RA emerges through a move to chain to a micro-cycle initiated by a student participant

rather than adult facilitator, which is relatively rare across the data in which adult facilitators lead LARP scaffolding activities.

Although it is only briefly explored here, Alvin's interjection on why babies cry does add an important layer to the substrate, surfacing reflections on frustration and jealousy about their inability to walk. This move marks a pre-reflective object for potential RA, as it draws another analogy between human babies and plants in general. The salience of this potential connection is only made clear in contextualizing it in the broader camp, where player-students continually reflect on mobility differences in the human-plant body problem. It is remarkable that the frustration a human baby might feel could be echoed across how a human being might feel frustrated in vying to gain traction in a conversation or a human role-player may feel while walking and also trying to embody a plant in character. To illustrate the challenge of walking while embodying plant relatives, I now turn to the opening minutes of a LARP hike that same day involving two older students (Dale and Ninja) and one younger student (Marvin).

7.30.15 Thursday LARP Hike to Beach

Marvin, Dale, and Ninja are part of a whole group hike to the beach. However, they largely keep their own three-person group, to which they've been assigned and tasked with role-playing a camp keystone relative of their choice. The interaction is filmed by myself, walking behind the group. The interactions of these three youth in this activity are considerably different from other interactions analyzed thus far. Overall, the frequency with which the group engaged RC was higher than any of the adult-facilitated groups I analyzed. Furthermore, without an adult facilitator, the responsibility for initiating RA fell to one of the young participants. Interestingly, most the RPs were issues by Marvin, the youngest member of the group by several years. I

interpret some of Marvin's moves as RPs even though he didn't always mark them ostensibly or as questions, because they appeared to be treated endogenously by the group as RPs.

A brief micro-biographical sketch helps to elucidate how the youngest member assumed the role typically enacted by adult facilitators when they lead activities. In the camp, Dale and Ninja are both members of the oldest group, get along well as friends, and both have parents who are adult designers and facilitators in the camp. Marvin is in the youngest group. Ninja and Marvin both identify with the same tribe. Typically, Indigenous youth who are older are taught to give considerable leeway to younger children, though they are also tasked with helping to guide them in the ways of their culture (e.g., Adair, Phillips, Ritchie, & Sachdeva, 2017; Whānau Manaaki, 2016). In a certain respect, Dale and especially Ninja appear to act Marvin's elder, and much of their interaction appears to position Ninja to initiate RA with Marvin, or Dale and Ninja to respond/evaluate (i.e., reflect on) Marvin's contributions. Indeed, Ninja is particularly attentive to helping Marvin choose the keystone plant relative to embody during the LARP hike. Dale rarely issued RPs during the hike, though he retains a highly responsive position. In short, Marvin does appear to stand at a relative age distance to the group, akin to how adult facilitators also stand at distance. Furthermore, both utilize RPs as bids to engage the other interactants.

1065 **The audio recording does not work for the first 19 seconds, so we initially**
 1066 **see visual data only.**
 1067 **((Dale who is holding a hula-hoop, Ninja, and Marvin walk side by side, in**
 1068 **that order from left to right, up the slow incline of a curving paved road**
 1069 **bordered by forests on either side))**
 1070 **((Dale is talking and angling his face toward the o-space of the moving f-**
 1071 **formation shared with Ninja and Marvin, whose faces appear to be**
 1072 **looking forward through the o-space but not at Dale to the left))**
 1073 **((Dale is still talking and Marvin turns his head to his left toward Dale))**

1101 Dale: #we'll destroy them!# ((Dale bounces the hula-hoop off his forehead and
 1102 makes an exploding sound))
 1103 ((Dale and Ninja begin to drift several feet apart from Marvin))
 1104 Ninja: Oh, I-I know one thing that (inaudible). (.) ^You know those American vine
 1105 things^?
 1106 Dale: Yeah
 1107 Ninja: Ok (.) We-we'll be one of those.
 1108 [(inaudible)]
 1109 Marvin: (((Marvin steps loudly and playfully back up to Ninja and Dale))
 1110 #time to raid these (inaudible)#
 1111 ((Marvin raises arms in plant icon and runs ahead of the group and close
 1112 to the boundary between the gravel and the edge of the forest))
 1113 Dale: (((Dale very briefly places the hula-hoop around Marvin's head))
 1114 [(inaudible)]
 1115 Ninja: You are no longer a blackberry
 1116 Marvin: Ok (.) now what am I?
 1117 Ninja: (inaudible)
 1118 Dale: feel grass
 1119 (((Dale throws arms up in air and smiles))
 1120 (group laughter)
 1121 ((Marvin walks with arms held up and steps wide and long))

Based on these initial glimpses into their interactive dynamic, Marvin appears focused on blackberries, calling attention to them on the side of the path as they walk. Dale and Ninja appear responsive to Marvin's directives, such as when the whole group orients to and even drifts toward where Marvin points. This appears to have a limit, however, when Dale calls for destroying blackberries, which is followed by pivoting on the hula-hoop he is holding as some kind of explosive device ostensibly directed toward destroying blackberries. Ninja follows

Dale's turn by proposing they be American Vines, and just after this, when Marvin runs toward the boundary between the path the forest Dale makes a gesture with the hula-hoop that appears to "rein in" Marvin and Ninja announces to Marvin that he is no longer a blackberry. Marvin ratifies these moves in asking Ninja "now what am I?". Ninja's reply is inaudible, but Dale proposes eel grass while making a playful gesture that evokes collective laughter. Marvin responds playfully and does not appear to reject Dale's proposal. Already, the group power dynamic, in which Marvin is given some explorative leeway but bounded at the same time by his older peers, is in motion.

These brief interactions already pose challenges to the boundaries of what I could analytically code as RA. Given the broad definition, I can always argue that all semiotic actions, which include all spoken language, are autonomically reflective of something. For example, when Marvin points to blackberries and calls out blackberries, his actions autonomically reflect his participation in a particular cultural practice that names these plants and calls them "blackberries," which in itself reflects the berries that are black which the plant produces. Analytically, if a particular autonomic reflection is contextually revealed to be a pre-reflective object that pre-grounds RA later in the interaction (Sacks et al., 1974), then it is worth attending to when it first appears in interaction. Thus, Marvin's attention to blackberries here is more than a mundane reflection. Given how blackberries feature throughout this interaction, I have chosen to code Marvin's first orientation to them as a RP toward collective RA. This initial orientation is subsequently legitimized as the emergence of a pre-reflective object because (1) the name "blackberry" becomes subject to considerable reflection and (2) Marvin's recurring interest in blackberries drives significant chunks of collective RA of the group. Thus, while prompts toward reflection-on-action, to step back and think about a given RO, appear rarely here, the interactive

dynamics of this activity do exhibit regular prompts toward reflection-in-action. These prompts are largely conveyed by initiating new actions that are ratified by collective response (Sacks et al., 1974). In other words, as much as any other episode analyzed in this corpus of LARP data, this episode exhibits the extent to which RA is endogenously constructed and made meaningful during situated interaction.

- 1122 Dale: eel grass (inaudible)
- 1123 Marvin: #New blackberry# ((in a sing-songy voice)) gro::ve
- 1124 Ninja: Okay we'll be the American Vine. (inaudible) American vine is an evil and
1125 dangerous thing.
- 1126 Dale: eel grass (.) <our only purpose is to be eaten (inaudible)> (.) >(inaudible)<
- 1127 Ninja: ((laughs))
- 1128 Dale: (inaudible)
- 1129 Marvin: I think they call—I think blackberries are black—I think blackberries are
1130 [(inaudible)—
- 1131 UY:
- 1132 [(inaudible)
- 1133 Ninja: (((Ninja turns to and points at Marvin)))
1134 [You're racist!
1135 (everyone giggles)
- 1136 Marvin: I think blackberries are black because they [(inaudible)
- 1137 Dale: [(RACIST)!]
- 1138 Marvin: I think blackberries are black because they're evil. (.) Righ^t?
- 1139 Dale: That's racist. (in laughing voice) that's really racist.
1140 [(5 seconds silence among the group))
1141 [(crosstalk from other hiking groups passes by))
- 1142 Ninja: Why-why are they black?
- 1143 Dale: Typical blackberries

- 1144 **Marvin:** **Yes and they—and they’re evil. (...) All evil—**
- 1145 **Dale:** **I think it would be called—I think we would call it—^you know how like**
- 1146 **black and red are the color for evil^**
- 1147 **Marvin:** **[Yeah: black and red, black and red (inaudible)]**
- 1148 **Ninja:** **[(singing) <We (.) are (.) fer^ns dun dun-dun dun>]**
- 1149 **Dale:** **[(making eye contact with Ninja)] (singing) We (.) are (.) fer^ns**
- 1150 **[dun dun-dun dun]**
- 1151 **Ninja:** **[dun dun-dun dun]**
- 1152 **Marvin:** **What are: ferns?**

The interaction around the blackberry name appears to be transformed into the RO of the activity substrate marked for further RA. Marvin frames his turns with metapragmatics that make explicit and visible his reflective thinking. Marvin is attempting to share a reflection about why blackberries are called blackberries, and the first two times he is unable to finish his utterance without overlapping speech. Ninja appears to jokingly tease Marvin by telling him that he is “racist.” On his third attempt, Marvin is able to complete his utterance, making clear that he is engaging publicly visible RA as a prompt for the others to reflect with him. Dale responds to Marvin playfully (as indicated by paralinguistic tones of smile voice and laughter), teasing him by saying “that’s really racist,” shifting attention from ‘you’re’ to ‘that’s.’ Several possible meanings may follow from this—such as how Dale and Ninja, as Marvin’s elders, are finding playful ways to teach Marvin about hearably racist talk—and the interactive meaning remains ambiguous, perhaps deliberately so (Eisenberg, 1984).

However, Marvin may be attempting to work out another logic, rather than advancing a racist view of black=evil. Ninja had already referred to American Vines as “evil and dangerous,” which may be a play on the word “American”. Word play is a common form of play that disadvantaged youth engage to call out and disrupt hegemonic language practices of dominant

cultures (Blanch, 2011; Cannon, 2017; Neuman, 2008). Thus, Marvin may be vying to join in the linking modeled by Ninja, whereby “America” as a well-documented oppressor of Indigenous peoples (Wolfe, 2006) can be “evil and dangerous.” Blackberries are prevalent in the region’s ecosystem, generally categorized as an “invasive species” which Dale implies need to be destroyed. It is possible then that Malcolm is drawing an equivalence between blackberries and Ninja’s word play with American and evil. However, this can only be inferred by drawing together disparate instances of Marvin’s expressed positions. What is heard by the group is that they are “black because they’re evil.” However, after a five-second passage of time during which no one talks, Ninja revisits the question, opening up a space for reflecting on why they are black. As Dale attempts to help Marvin work out a possible explanation, linking black and red to evil with a folk theory that appears to naturalize their connection (Fox & Robles, 2010), Ninja disrupts the progression of the conversation with prosodic lamination of a catchy advertising song that re-orient the group to ferns.

Ninja’s two moves here are noteworthy on at least two fronts. First, he makes his clearest RP for intentional reflection yet, bearing some ostensive marking of repeated word use, locating the question squarely in the interactive space reflective toward the substrate of blackberries. As Marvin and Dale take turns reflectively responding, Ninja disrupts this aligned reflective space he had just helped set in motion. Ninja’s move reworks the entire energy of the interaction by an apparently absurdist departure from the blackberry substrate and onto a new plant relative different (sword fern), and Dale joins Ninja singing the song. This appears sufficient to re-orient Marvin, who asks an ostensively marked question requesting knowledge from his interlocutors, formally positioning himself as a learner vis-à-vis his elders. Marvin’s RP about ferns marks the expansion of the mutual orientation of the discourse substrate to include ferns (ratifying meta-

communicative moves that appear to already mutually engage Ninja and Dale). This sequence of moves expands the RO from blackberries, which had been the dominant indicator made visible in the interaction thus far, to ferns.

- 1153 **Ninja:** **There's sword fern [(.) right there (.) to the right**
- 1154 **[(points with his left hand to the right)]**
- 1155 **[(Marvin looks to the right in the direction Ninja has pointed)]**
- 1156 **Dale:** **Sword Ferns— (inaudible)**
- 1157 **Marvin:** **yeah-#YEAH, but us blackberries take over the ferns# (..)**
- 1158 **[Ya Ya Ya! #I'm taking over you#!**
- 1159 **[(Marvin extends arms in plant icon and stomp walks toward Dale and**
- 1160 **Ninja)]**
- 1161 **Ninja:** **[(Ninja whispers to Dale and then runs ahead)]**
- 1162 **Dale:** **No! ((Dale runs ahead to Ninja))**
- 1163 **Marvin:** **[(Marvin runs after Dale and Ninja)]**
- 1164 **[(..) #I'm taking you over#. I'm devouring you.**
- 1165 **[(10s pass of inaudible talking and laughing while walking up ahead of camera)]**
- 1166 **Marvin:** **Okay:: can you guys slice off (inaudible) for humans?**
- 1167 **Ninja:** **Okay yeah. Sword ferns really have a (inaudible)**
- 1168 **Dale:** **(inaudible). You can use a sword fern (inaudible). Yes, there's one sword.**
- 1169 **(Inaudible) (crosstalk) You slice through the air**
- 1170 **Ninja:** **Imagine a (crosstalk)**
- 1171 **Marvin:** **You mean that #>the tale of the heroic sword ferns<#?**
- 1172 **Dale:** **Yes. There's one sword fern, that is able—if you hold it correctly**
- 1173 **—huh?**
- 1174 **[(inaudible exchange between Ninja and Dale)]**
- 1175 **Dale:** **Run!**
- 1176 **Marvin:** **[(Marvin begins stomping on Dale and Ninja's shadows)]**

1177 [I'm stepping on your shadow (inaudible). Boom boom boom. (inaudible)]

1178 **face!**

1179 Dale: (inaudible)

1180 Marvin: **Shadow [(inaudible)!]**

1181 Ninja: **[Okay, you have to be a—you have to be a a new (inaudible) plant.**

1182 **What are you gonna be?**

1183 Marvin: **I'm blackberry! Blackberries**

1184 Ninja: **No you have to be a new one.**

1185 Marvin: **No. Okay I'm the heroic sword fern.**

1186 Ninja: **No you have to choose a new (.) one.**

1187 Marvin: **How about (.) how about:::t [(...) how about the >heroic< (..) pine trees?**

1188 Ninja: **[the stinging nettle**

1189 Marvin: **[((points up toward the sky))**

1190 **[They give air to humans.**

1191 Dale: **You could've—you could've been the >(defenseless?) nettle<.**

1192 Ninja: **I'm the (defenseless?) nettle, yeah. (crosstalk)**

1193 Marvin: **How about pine trees? They give oxygen to everybody in the forest.**

1194 Ninja: (inaudible crosstalk) **We're the guardians of the forest**

1195 Dale: **We can just be a type of like (.) um forest. One nettle (.) blackberry bushes**

1196 **are**

1197 **another [(inaudible)]**

In asking what are ferns, emphasizing “are:”, in effect an ostensive marking of a space for pedagogical communication, Marvin prompts Dale and Ninja to teach him I-STEAM relevant information for the first time in the activity. Ninja’s RR is an environmentally coupled gesture (Goodwin, 2018) that directs Marvin’s attention to an actual Sword Fern in their immediate environment. While spoken words and bodies have commonly mediated the semiotic action of RA during I-STEAM LARP, this exchange demonstrates how aspects of the environment can

also help mediate RA. Marvin responds to this new knowledge by layering play onto the reflective space, interactively helping to web the ROs of blackberries and sword ferns into a common substrate from the perspective of their relations. Marvin proposes a relation in play in which blackberries “take over” and “devour” sword ferns, which the group takes up in a playful manner for several turns.

As seen before, Dale and Ninja appear to maintain a boundary on an intensive threshold with Marvin’s playful affect. Curtailing the immersive play of the group, as Marvin becomes more excited, Ninja returns to the assignment of the activity, initiating a different kind of ostensibly marked space. It exhibits contingent and ostensive markings that indicate the opening of an ostensive-referential interactive space, and though it is not asking for extensive reflection, it is prompting Marvin to participate in adding “new” referential layers to the cycles of play-and-reflection oriented toward the interactive substrate. Ninja’s bid to re-organize the mutual orientation of the group toward the double lamination of I-STEAM knowledge and I-STEAM LARP will only be successful if Marvin remains contingently engaged with Ninja. After some further negotiating with Ninja, Marvin ratifies Ninja’s bid and orients to pine trees. The result is that the interactive substrate has now cued up four possible relations: blackberry, sword fern, stinging nettle and pine trees.

This interaction also evidences the endogenous pattern in which proposals for which plant to be are interactively distributed across RP-RR adjacent pairs. Initially, it is Ninja who prompts Marvin to reflect on his plant choice, with RA directed toward thinking of a “new” plant. However, Marvin attempts to turn the process around, soliciting RRs but not receiving ratification. Marvin then concedes that he will be nettle, aligning with Ninja’s decision. This does receive a response, but again Marvin is directed to choose a different identity, re-initiating

collective RA toward an appropriate plant relative for Marvin. The interactive dynamic here further affirms Marvin's ratification of Ninja's authority to adjudicate Marvin's choices.

These interactive negotiations between Marvin and the two older youth show how RA differentially becomes a resource to bid for participation. In its phatic aspects, such as the procedurally phatic process of choosing a plant character, Marvin and Ninja distribute RP-RR adjacent pairs to negotiate a sanctioned plant character for Marvin. In its referential aspects, such as play-acting sword fern blackberry relations, Marvin utilizes RA to achieve a ratified standing as a participant contributing to the interactive substrate.

This chunk also evidences how much the group continues to rely on the kind of word play that started with blackberries. Sword Fern are linked to slicing "through the air" and Dale makes a cultural reference to the Sword in the Stone, a remnant of popular youth culture. Marvin who caught on to this sense of word play, suggesting that they were telling the tale of the "heroic Sword Fern", continued the word play by proposing to be "heroic" pine trees. However, Dale and Ninja had moved on to laminating word play onto stinging nettle. The pedagogical value of this joke is heightened by the ostensive marking of Dale's turn, in which he starts the utterance twice and slows his delivery when saying "(defenseless?) nettle."

- 1198 **Marvin:** **[Okay I'm gonna be a nettle!**
- 1199 **Ninja:** **No you have to be something different=**
- 1200 **Marvin:** **=Blackberry**
- 1201 **Ninja:** **no not that you've already been that one**
- 1202
- 1203 **Marvin:** **Why?**
- 1204 **Ninja:** **Because (.) you've already been a blackberry.**
- 1205 **Dale:** **You can have two people. Like, one person's nettle -**
- 1206 **Ninja:** **(inaudible)... We're keystone species so you have to...**

1207 Marvin: Okay, what are keystone species? (crosstalk)

1208 Dale: Actually, the people who were here first (..) at the circle^ (.) were the ones

1209 that were keystone species -

1210 Marvin: (((Marvin points toward grass))

1211 [GRASS.]

1212 Dale: inaudible

1213 Marvin: (((Marvin points toward trees))

1214 [Trees]

1215 Ninja: Ah what kind of tree?

1216 Marvin: Can I be a palm tree?

1217 Ninja: Ah snake!

1218 Marvin: That's a >bungee cor::d<!

1219 ((several second break))

1220 Dale: (((singing the same sing-song melody as earlier))

1221 We are bushes (.) dun dun-dun dun

1222 Marvin: I'm going to be a pine tree because

1223 (((points high up in the high sky, possibly toward trees and/or as tree

1224 icon))

1225 [they give oxygen to other plants.]

1226 Ninja: What else do you do?

1227 Dale: Trees take in carbon dioxide, not oxygen. (.) They give oxygen.

1228 [(inaudible)]

1229 Marvin: [And they breathe in carbon >dioxi::de<

1230 (6 lines omitted)

1231 Marvin: So pine trees - so trees are keystone species. And they breathe in carbon

1232 dioxide and they breathe out ...

1233 Dale: Kind of. Certain trees are. Some trees can be invasive. Some trees can

1234 just be there because of that (inaudible)

1235 Ninja: **And some trees can be (inaudible)**

1236 Marvin: **Can I be... Can I be that tree with the (pointing) - can I be a maple tree?**

1237 **(.....)Cause maple trees can give maple and they breathe in carbon**

1238 **dioxide and they breathe out...**

1239 Ninja: **Oxygen**

1240 Dale: I wanna be (inaudible). **I shall be the stinging nettle.**

1241 Marvin: **Ahh...But that's not a keystone species.**

1242 Ninja: **Yes it is.**

1243 Dale: **Well they're - well yeah they kind of are, they protect the forest -**

1244 Ninja: **Yeah they give people some string to make cordage and they give people**

1245 **medicine. And they give people stuff [to eat] and they also contribute to**

1246 **the forest**

1247 Dale: **And they help (inaudible)**

1248 Ninja: **Yeah. They most definitely are a keystone species.**

1249 Dale: **Also they make sure that you look around instead of stepping everywhere**

1250 **so that you don't get stung for 5 hours.**

1251 Ninja: **Horsetail, look at the horsetail. [Our job is to (inaudible)**

1252 Dale: **[You'll be a useless horsetail**

1253 Ninja: **Horsetails are very good! (crosstalk)**

1254 Marvin: **Horsetails just hang around and stay still.**

1255 Ninja: **They are very good for medicine (.) and very yummy. (crosstalk with Dale)**

1256 **Super good for medicine.**

Marvin persists in his bid for the group to reflect on his choice to role-play pine tree. In both his bids to be pine tree, Marvin offers his own RR, linking pines to their gifts, first “air to humans”, and then narrowing air to “oxygen” and expanding the recipients to “everybody in the forest”. These referential justifications give the group chances to respond to Marvin on both phatic grounds (whether or not to ratify his proposed character), and on referential grounds (to

reflect with Marvin on these purported pine tree gifts). However, Dale and Ninja continue their play on Sword Fern, imagining themselves to be protectors of the forest as nettles and sword ferns. Not receiving a response to his bid to distribute reflection on pine tree, Marvin makes a bid to re-align with the group by proposing he can be nettle. Again adopting the position of evaluating Marvin's proposals, Ninja reflects with Marvin on why each proposal will not satisfy the assignment, until a phrase is used that Marvin does not understand: "keystone species". In turn, for the second time in the activity, Marvin explicitly positions Dale and Ninja to teach him I-STEAM relevant knowledge.

What follows are a series of turns in which the group begins to shift attention from the phatic concern of what character to be to engaging in referential and pedagogical discussions about keystone species, including which trees are keystone, clarifying again the ecosystemic loops involving trees, oxygen, and carbon dioxide. When Dale proposes that he will be stinging nettle (interestingly, Marvin was denied this option earlier), Marvin objects that these are not keystone. However, rather than simply disagree with Marvin, Ninja and Dale help teach him through a series of RCs that nettle protect the forest and offer up food to the forest, and give humans cordage, medicine, and food. Additionally, their moniker as "stinging" is re-positioned axiologically as a means to increasing human care when walking through the forest. Ninja then declares he will be horsetail. Ninja's choice does not need to be adjudicated, as implied by Dale's ratifying next-turn reply, again implying the power structure in which Marvin is clearly positioned as the younger member of the group. However, Dale does challenge Ninja, and Marvin attempts to align with this challenge, giving Ninja an opportunity to reflect on the value of horsetail as medicine and food.

The findings here about the social distribution of RA appear contrary with the overall I-STEAM LARP arc in which a perceived elder of a group initiates RA through RPs that distribute single RAs across multiple interactants. In other words, Dale and Ninja, who are older youth peers, rarely appear to prompt each other to reflect, though they continually engage RA through RCs that do not appear to be prompts or responses to prompts. However, when talking to Marvin, they are more likely to utilize RPs to engage him, often in the service of pressing him to reflect further on his choice of which plant relative to embody. Marvin, who is much younger than them, appears to use RPs as an interactive function to bid for their responses. In total, I've coded Marvin as initiating interactively ratified reflection 26 times, Ninja 7 times, and Dale once. Closer analysis shows a variance in how each person used prompts to move the interaction along. For example, Ninja initiates autonomic RA, likely directed to Dale because Marvin is away from them at that instant, if he knows American Vines. Ninja's response appears to indicate that Dale acknowledges knowing them. This interaction reflected that both interlocutors knew of the existence of American Vines, which was the extent of the reflection, designed to introduce a potential substrate for the activity, which would likely be altered by further RA during the hike. Most of Ninja's RPs prompt Marvin to think about what plant relative he will be, often clarifying or reiterating rules governing their options.

As seen with how Alvin negotiated for interactional power with his group involving an adult facilitator, how RA is taken up, along both its phatic and referential aspects, is an interactional resource to negotiating participation frameworks and the projectible interactive substrate. Across this hike, however, the negotiation of power appeared much more visible among youth than when adult facilitators are present. This does not mean there are not visible power struggles involving youth and adult facilitators, as interactions with Alvin made clear, but

rather peer to peer interactions among youth appear to display an openness and normalcy to power negotiations that is less prevalent with adult to youth interactions. In other words, adult facilitators such as Priya or Gabe tend to adapt (by either pivoting or using long silent pauses), making contingent responsiveness visible, whereas youth to youth interactions simply plunge forward with much less visible contingent responsiveness. Instead, persistence appears crucial, as Marvin himself continually bid for ratified participation by adapting his bids to the shifting dynamics of ongoing interaction. Interestingly, a successful part of Marvin's interactional strategy appeared to be when he displayed contingent relationality to the Ninja and Dale as experts, such as asking them what sword ferns or keystone species were. In both cases, considerable referential interaction followed, inflecting RA from its autonomic and phatic aspects to its more intentional and referential aspects. Two parallels between Marvin as the youngest member of youth peer group and adult facilitators are striking. First, both produce by far the most RPs to RA. Second, both succeed in balancing the power negotiations of the phatic connection by exhibiting contingent relationality to others in the group, stabilizing the interactive grounds well enough for more substantive referential, intentionally reflective, and pedagogical communications. This marks the end of transcript which I've transcribed for IA. The remainder, a text transcription of spoken discourse, is available in Appendix C.

7.31.15 LARP Finale

The activity structure of the Finale was different from any other, in which players engaged in continuous play throughout the activity, making it initially difficult to decipher how RA was distributed across the activity. However, given the emphasis throughout the week in LARP scaffolding exercises on the purpose of play, it seems likely that players were learning more than simply how to respond to an immediately stimulating interaction. At a minimum, their

responses autonomically reflected learning across multiple layers designed for and emphasized throughout the camp: (1) they were learning patterned responses to prototypical eco-interactions in both LARP and non-LARP activities; (2) they were learning how to embody these responses from a first-person perspective during LARP; (3) from facilitator responses during the scaffolding exercises, they were learning that their simulated enactments informed them as to how actual eco-relations may unfold. Putting all three layers together, which would require some degree of reflective processing that may or may not be publicly visible, player-participants would make the inference that their actions during the Finale represented possible actual eco-interactions simulated in their playworld. Given how often play stayed in frame or on the rim, and how infrequently players stepped outside of frame completely to negotiate the frame, suggests that players largely agreed on the underlying eco-logics of their playworld (cf. Giffin, 1990).

Given that adult players often ratified choices made by youth during play further appeared to interactively validate how play was unfolding. Furthermore, given how much difficulty adults had on deciding whether or not to permit one participant, Kal to be an Ewok, indicates that adults were regulating the realistic boundaries of the playworld. In short, it seems to reason that adults, who were the more-knowledgeable-others in the playworld about the actual ecosystem simulated in the playworld, would likely have objected to play that became unrealistic, and all players were aware of this. In turn, given how play actually unfolded, it appears that adults rarely needed to actively enforce the boundaries, interactively signaling to the players that their actions were legitimized. Given how players continued to build actions based on accumulating substrates of earlier actions during the Finale, their subsequent actions reflect that they comprehended that their prior actions were legitimate. In short, subsequent actions

building on prior actions affirms that they were learning, in situ, that the emergent scenarios they were playing out represented possible actual eco-scenarios. Any number of interactive signals would have indicated otherwise: (1) MKOs rejecting the unfolding action as unrealistic; (2) youth failing to chain their actions to each other and a general sense of discontinuity across the play; (3) youth unable to agree on a common ground for play. Each of these indeed did occur, but their repair and relative infrequency indicate that they were not the norm for play. In short, it seems to reason that although youth were not explicitly tested on what they learned, and intentional reflection entailing “stepping back” from the action to reflect was situationally impractical for the Finale, considerable learning was taking place and the mediations of pedagogy and reflection took on a situationally contingent function to fit the Finale’s emplacement in the broader arc of both I-STEAM camp overall and LARP specifically.

Appendix C: 2015 I-STEAM LARP Transcription

7.27.15 Monday GC Story Transcription

1257 **Gabe:** [((Gabe clasps hands together into an interlocked fist in front of his
1258 mouth and scans the group turning his head repeatedly left to right))
1259 [so (..) ((exhale))
1260 I'm gonna need (.) Charlene—#actually I'm going to need (.) just about
1261 anybody's help who can remember <a story># (.)
1262 ((exhale))
1263 uhh (.) not everybody apparently
1264 [((rubs hands together just to the left of his face))
1265 [got to hear all uh (.) all of the stories that were:
1266 to be told >one of them< particularly important
1267 (.) ^can e—can anybody remember the story about the <Grandmother
1268 Cedar^>?
1269 **Multiple:** [((about five hands are raised))
1270 [^ME:^
1271 **Gabe:** ooh, oh ((inhale)) ok: (.) so: (.)
1272 we need (.) we need some <storytelling to go on> (.)
1273 [((raises right wrist and looks at watch))
1274 [>really quickly< (.) (inaudible) uh:
1275 [((turns to look at Charlene))
1276 [Charlene I'll let you lead on it
1277 **Charlene:** (.) so (.) >very quickly<
1278 and maybe (.) somebody (.) from my: group (.)
1279 [((looking toward Marvin))
1280 [>^Marvin (.) do you want to help me^?<
1281 **Marvin:** Mm-hmm (affirmative)
1282 ((Marvin begins walking toward Charlene))

1283 Charlene: you can help be my (.)[my (.) tree (.) ^all righ^t^?

1284 [((steps to front of group and turns to face it))

1285 Marvin: [((Marvin steps to the front of the group and stands to left side of

1286 Charlene))

1287 Charlene: [^will you be my >grandson tree< and I'll be the grandmother tree?^

1288 [((Charlene and Marvin angle their bodies to an open-L arrangement

1289 facing the group))

1290 (.)

1291 So (.) Grandmother tree (.) and Grandson tree

1292 [love each other very much.

1293 [((places hand over hand, open palms, over her heart))

1294 (.) and the Grandmother tree—(.) her job is to <take care> (.) of the

1295 Grandson tree

1296 (.) and so on a day like [today—

1297 [((raises her hands up, shoulder height, facing

1298 inward))

1299 oh it's so ho:t (.) and the sun is beating [dow:n

1300 [((fingertips touch shoulders))

1301

1302 (.) and poor little grandson tree #is starting [to wilt#

1303 [((drops head forward and

1304 arms to her

1305 sides))

1306 (.) and he's starting to <fee:l)) [the

1307 [((raises forearms and hands to shoulders,

1308 turned inward))

1309 [heat> and the [sun (.)

1310 [curls fingers [curls fingers

1311 [so Grandmother tree—

1312 (((raises elbows chest height, rotates lower arms toward front of chest,

1313 interlaces fingers))

1314 >^does everybody remember what Grandmother tree does to help create

1315 shade?^<

1316 Multiple: ((Several youth hold up both arms above each other's heads))

1317 UY: she blocks [(inaudible)=

1318 Charlene: (((Charlene extends arms fully forward and slightly upward,

1319 hands

1320 facing down and fingers interlocked, above Marvin's head))

1321 Charlene: =[yeah: (.)

1322 (((several youth continue to hold both arms up; and some older youth

1323 hold arms

1324 over heads of younger youth; all of this is done quietly with numerous

1325 smiles))

1326 she [blocks (.) and #creates some sha:de#=

1327 (((fully extends all fingers then sways arms gently left to right over

1328 Marvin's head))

1329 =(Gabe extends arms forward))

1330 Charlene: (((Charlene drops arms and stops embodied actions)

1331 [and when (.) #it's <very windy out># (.) >^what does Grandmother Cedar

1332 do^?<

1333 ((Nina continues to hold both arms up covering Regan who is taller than

1334 she))

1335 Gabe: (((raises and extends arms in front of his body))

1336 Charlene: (((extends both arms forward, left arm shoulder height, right

1337 arm waist height, extending fingers in front of and facing

1338 Marvin))

1339 **(((turning body toward Marvin, arms bent 90 degrees))**

1340 **[She blocks the wind**

1341 **so that poor little grandson cedar tree >when it's really**

1342 **[windy<**

1343 **(((waving hands back and forth in front of Marvin with increasing**

1344 **intensity))**

1345 **(((Nina extends her arms out in front of Regan's body))**

1346 **((to Marvin)) >*pretend it's really windy*<**

1347 **[and he's (.) twisting this way and that way (.) OH no!**

1348 **Marvin:** **(((Marvin begins to sway his body back and forth))**

1349 **Charlene:** **(((extends arms and hands in front of Marvin))**

1350 **[and then I <block [it>**

1351 **(((Marvin stops swaying))**

1352 **(..) and he's <all safe>(.)**

1353 **(((Charlene drops arms and turns body back toward group))**

1354 **(((Nina drops her arms))**

1355 **and then (.) when um Grandson Cedar**

1356 **—when [#the deer: (.) start to nibble (.)#**

1357 **(((raises hands to mouth and shows teeth))**

1358 **(((turns toward Marvin again))**

1359 **[and they get hungry**

1360 **>and they start to [nibble< and they're eating all: of his <#tender little**

1361 **branches#>**

1362 **(((Charlene extends pinched fingers and play-pinches at**

1363 **Marvin's arms)**

1364 **>what does Grandmother Cedar do?<**

1365 **Marvin:** **(inaudible) shoos them**

1366 **Charlene:** **(((extends both arms fully in front of body, hands facing downward,**

1367 flipping hands from low to high in a shooping motion))

1368 [shoos them. shoos away the (.) deer

1369 ((several youth repeat this action almost immediately after Charlene

1370 commences this action))

1371 (.) and when he's lo:nely (.) ((orienting head to Marvin)) *what do you look

1372 like if you were lonely?*

1373 Marvin: mmm:

1374 Charlene: you'd be sad?

1375 Marvin: mm-[l: don't know

1376 (((Marvin folds arms and hands over the top of his head))

1377 Nina: ((Nina waves both hands toward herself))

1378 Charlene: oh okay (.) (((Charlene turns toward the group))

1379 [uhm and if you were lo:nely (.)

1380 (((Charlene, upper arms akimbo, and lower arms rotated so hands facing

1381 herself

1382 with palms open, waves her arms and hands toward herself)

1383 (((several youth quickly enact this same motion, starting and stopping in

1384 sync with Charlene))

1385 [she calls i:n the squirr:els and the bir:ds (.) and she calls in um the

1386 butterflies and she says "come and be with (((turns head to look directly

1387 at Marvin))

1388 [my Grandson Cedar"

1389 (..) and then he gets older

1390 [(.) and *bigger (.) and bigger (.) and bigger* and pretty soon he's really

1391 tall:

1392 [(Charlene bends forward and downward toward Marvin, puts hands on

1393 legs, and

1394 crouches down to ground so she's shorter than Marvin))

1423 ((Marvin and Nina both wave their lower arms and hands toward
 1424 themselves))
 1425 Charlene: (.) yeah, he <calls in> all of the birds and um
 1426 all of the other animals to be with her
 1427 ((a few youth motion both hands toward their bodies))
 1428 ((Gabe walks over to Charlene and flitters his fingers above her head))
 1429 ((Miguel walks toward her, mouth agape rotating arms up in air))
 1430 ((group laughs, Charlene looks toward Gabe and laughs))
 1431 Charlene: ((Charlene looks to Miguel, as he's waving his arms and she's still
 1432 crouched))
 1433 ((..) and what else Miguel? >I'm missing one more thing< do you
 1434 remember?
 1435 Miguel: mm
 1436 Charlene: when he's ((holds up one thumb toward Miguel))
 1437 [lo::nely (.)
 1438 Charlene: ((Charlene looks to and points at Jake))
 1439 [Jake?
 1440 Jake: the deer start [to nibble.
 1441 Charlene: ((Charlene pulls hands to her chin, facing inward, and
 1442 shakes))
 1443 [the deer >start ^to nibble at me AHH!^<
 1444 ((Gabe runs up to Charlene and makes nibbling gesture towards her with
 1445 his hands))
 1446 and [what does he do?
 1447 ((Marvin starts to wave both hands in shooping motion))
 1448 Charlene: he shoos them [away:: ((laughs))
 1449 ((Zale runs up to Charlene and raises her hands toward
 1450 her own face

- 1451 and makes nibbling gesture))
- 1452 Charlene: ((to Zale)) oh you're a little deer?
- 1453 Group: ((laughter))
- 1454 Charlene: (((Charlene stands up and squares to face whole group))
- 1455 [(..) and so (..) (((holds hands to her sides at waste, palms facing up and
- 1456 slightly
- 1457 outward))
- 1458 [^what did we lear:n^ [(.) in that story?
- 1459 (((Regan holds her hand up))
- 1460 ((Charlene points to Regan))
- 1461 Regan: (inaudible) I can't figure out how to say it (.) but to take care or like (.) to
- 1462 ^give back^
- 1463 Charlene: mm-hmm (affirmative) to reciprocate
- 1464 (.) does anybody else know what reciprocate means? (.) To be reciprocal?
- 1465 (.....) No?
- 1466 ((to Marvin)) Yeah you do?
- 1467 Marvin: mm (.) actually I was just waving at my: sister
- 1468 Charlene: oh, yeah(.) so it's helping one another, (((nods head up and down))
- 1469 [right? when somebody does
- 1470 something for you when they take care of you, you take care of <them
- 1471 when they need it>
- 1472 Gabe: it's a [sense of—
- 1473 Jeanette: [think of a teeter-totter (.) a teeter-totter is reciprocating
- 1474 (.) you know teeter-totter?
- 1475 Multiple: uh:.
- 1476 Jeanette: (((holds left arm high and right arm low and joins arms at hands, matches
- 1477 motion of going up and down in alignment with her words))
- 1478 [when one is up (.) the other's down (.) and then when the other's

- 1479 up (.) that's called reciprocating.
- 1480 Gabe: Balance.
- 1481 Zale: I'm good at those.
- 1482 Gabe: good. [(.) you'll need that today.
- 1483 [((Gabe places right hand on Zale's head))
- 1484 Gabe: uhm (.)[((Gabe joins hands, palms facing each other in front of mouth and
- 1485 points
- 1486 at crowd on the beat of each of his words))
- 1487 [so (..) now that you all (.) have (.) seen Grandma—Grandmother
- 1488 Cedar (..)[((Gabe points joined hands at group))
- 1489 [I'm going to divide y'all up into your groups right now (.)
- 1490 [((Gabe points joined hands on beat of every word phrase until his next
- 1491 gesture))
- 1492 [and what you're going to do (..) is you're going to be:: (..) cedar trees (.)
- 1493 you're
- 1494 going to be Grandmother Cedar (.) you're going to be Grandson Cedar (.)
- 1495 you're going to (.) remember [((Gabe holds four fingers up to group))
- 1496 [<ALL FOUR OF THOSE MOVEMENTS>
- 1497 what were they again? (...)
- 1498 [((Gabe covers left hand with right hand))
- 1499 [>to show shade (.) to bring out shade< (.) what were they?
- 1500 Group: shade sha:de
- 1501 ((overlapping talk))
- 1502 Jake: blockin' wind
- 1503 Gabe: alright (.) [blockin' wind
- 1504 [((Charlene extends arms in front of her body))
- 1505 ((several youth repeat this action))
- 1506 Jake: shoo the deer

1507 Gabe: shoo the deers away

1508 (((Gabe and several participants make shooing motion with his arms))

1509 Jake: [and bring: (.) company?

1510 Gabe: and then bring [company (..) right?

1511 (((Gabe and several participants motion the bring company

1512 icon))

1513 (.) <those four things> (.) >#that's only four things now a cedar tree lives

1514 for a very long time doesn't it?#< (.) how long?

1515 (..) like #way longer than any of us#

1516 Michael: =100 years?

1517 Gabe: huh?

1518 Trent: a thousand

1519 Gabe: (((Gabe turns to Trent))

1520 [a thousand years?

1521 Zale: 10,000

1522 Gabe: (((Gabe turns to Zale))

1523 [#10,000 years?#

1524 ((laughter from group))

1525 they live A LOT LONGER than us

1526 UY: a year

1527 Gabe: *more than a year (.) maybe if you cut it down*#

1528 Marvin: (((Marvin holds both arms up and out above his head in tree icon))

1529 =[centuries?

1530 Gabe: maybe [centuries

1531 (((Gabe points to Marvin))

1532 (((Gabe then bounces pointing finger with the beat of his words))

1533

- 1534 **[(.) but we know that they live longer than us and that's what's the**
- 1535 **important thing=**
- 1536 **UY:** **=a billion years?**
- 1537 **Gabe:** **Now (.) if a tree is living longer than us (.)**
- 1538 **[((holds right fist in front of chest and bounces it with each word))**
- 1539 **[that means they go through experiencing a lot more stuff than just**
- 1540 **[((Gabe holds out counting fingers for each of the underlined**
- 1541 **words))**
- 1542 **[(.) loneliness than hot sun than wind than being eaten let's get**
- 1543 **together in our**
- 1544 **groups (.) let's think of some things that (.)**
- 1545 **[((Gabe points all his fingers at himself and then bounces and**
- 1546 **gesticulates holding the his**
- 1547 **hand out on the beat of his words through the end of his turn))**
- 1548 **[we: as cedar trees (.) will be experiencing (.) and then (.) how do we: (.) as**
- 1549 **cedar trees (.) move about (.) to reciprocate with one another (..) and to**
- 1550 **deal with (.) whatever problems are coming that way? or maybe it isn't**
- 1551 **even about problems (.) maybe it's even just about communicating with**
- 1552 **one another as (.) (inhale) cedar people.**
- 7.27.15 Monday LARP MB Small Group Transcription
- 1553 **MB:** **What do we think cedar's: life is like? Let's ima:gine**
- 1554 **[((MB turns face and orients eye to Gabe))**
- 1555 **[the life of the cedar [is what I think what you're after, right?**
- 1556 **[((Gabe rotates upper torso toward MB, into the O-**
- 1557 **space, points at**
- 1558 **her, and steps toward r-space outside of o-space))**
- 1559 **Charlene:** **mm-hmm**
- 1560 **MB:** **((MB looks across o-space at Charlene))**

1561 All right. So did we:: learn a little bit <about the life cycle> of a cedar
 1562 today^?

1563 (((tilts head slightly to right))

1564 (((lifts lower arms, holding hands at shoulder length with palms open and
 1565 facing outward toward Charlene))

1566 [Did you use that?

1567 Charlene: A little bit

1568 MB: So does everyone—(((opens arms outward to either side of her body,
 1569 palms open
 1570 facing the sky))

1571 [what does cedar start out like? Can everyone show
 1572 me:?

1573 (((steps back with her left leg, pauses, and then follows with her right))

1574 [Try to make it with your body. Be a #young: cedar
 1575 [tree# (.)

1576 (((Miguel begins to crouch and then Zale just behind Miguel and to
 1577 his right starts crouching into a squat a split second later and
 1578 then Charlene and Pearl and Olive squat))

1579 [What do you think a you::ng cedar tree is like?

1580 (((MB crouches down into a squat))

1581 [right here (...)((MB places hands on ground in front of her squatting
 1582 body))

1583 ((Alvin and Sal squat down and Tommy follows a split second later))

1584 (((David kneels on one knee facing the o-space))

1585 [>as close to the ground< (.) ((Charlene laughs))

1586 (((MB walks hands forward and puts her knees and shins on the
 1587 ground))

1588 MB: (.) but what happens before we're even a young cedar tree? (..)

1589 [What are we?

1590 Zale: [a little (((pinches the pads of her right index finger and thumb))

1591 [seed.

1592 MB: We're a little (((mirrors Zale's pinching gesture))

1593 [a little cone seed, right?

1594 [So can we get #e:ven tighter#? (.) #so: tight# (.) be a little seed?

1595 (((starts to lean forward and curl herself into a fetal ball))

1596 Multiple: ((Most youth begins curling into fetal balls))

1597 MB: ^And what—what happens in order for us as a seed to start growing?^

1598 Pearl: Wa-ter

1599 MB: Wa-ter:!(.) ^What else?^

1600 UY: f[ood?

1601 David: [su:n

1602 MB: So let's breathe in ^what do we think our seed

1603 [feels like^?

1604 (((Miguel drops into fetal ball matching all youth except David and

1605 Charlene))

1606 ((Charlene glances over at David))

1607 What a—>#we're a cedar seed# ^What does it feel like when we start

1608 getting water?^<

1609 [<What happens?> (.)

1610 UY: [(.) (inaudible)

1611 MB: ^Make your body feel like you're getting water on you.^

1612 Miguel: ((Miguel shouts non-verbal sounds as he thrusts his upper body up,

1613 springing his arms straight above his head))=

1614 Charlene: =((Charlene laughs and turns to look at Miguel))

1615 [Oo: you sprou^ted!

1616 **(((Tommy stands up and shouts a vocalic noise as he raises his arms**
1617 **fully extended to his sides))**

1618 **MB:** **(((looks up at Miguel))**
1619 **[Ohuh we've got one sprout! Oh:::**
1620 **^are we sprouting up^?**
1621 **[(...]**
1622 **(((everyone in the group lifts up their upper bodies in sync with MB who**
1623 **also extends raises her lower arms to extend left to right at shoulder**
1624 **length and lower arms raised upward at ninety degrees, palms facing o-**
1625 **space; everyone except Marvin and David emulates MB's arm extension**
1626 **almost immediately))**

1627 **[Do we have our <first limbs>?**

1628 **(((MB starts extending arms to her sides and 5 youth and Charlene**
1629 **emulate))**

1630 **David:** **We need nutrients.**

1631 **MB:** **We need [nutrients!=**

1632 **Charlene:** **[nutrients!**

1633 **MB:** **^How do we get NU^trients?^**

1634 **David:** **From the soil.**

1635 **MB:** **From the SOil!**

1636 **^So what do we need in the soil?^ (...) *What do we grow?^* (..[.)**

1637 **David:** **[[inaudible**
1638 **roots?]=**

1639 **MB:** **=We grow roo:ts.**

1640 **[I'm gonna make my toes be the (((MB pushes left foot into ground))**
1641 **roots: I feel like my toes are growing (.]**
1642 **and they're getting the nutrients**
1643 **from the soil.**

1644 (((Charlene moves right foot forward and
 1645 pushes bottom of toes into
 1646 ground))
 1647 MB (.) And then: what starts happening?
 1648 Miguel: We get bigger.
 1649 MB: We start to get bigger? K: How do we know: we're getting bigger?: (.)
 1650 What else is happening to us? (..)
 1651 Miguel: We start getting the flowers.
 1652 MB: We get flowers mmm (.)
 1653 UY: (inaudible) the leaves=
 1654 MB: =the leaves—you mean the needles? Yeah, we probably do get some of
 1655 those.
 1656 You know what though? I also think maybe we go through a winter (.) and
 1657 may:be we go through a summer:. There's a bunch of them probably so (.)
 1658 I bet it's ((shakes arms))
 1659 [cold
 1660 sometimes.
 1661 *Think cedar trees feel cold?* (.) Think we can #tell#? ^What do you think
 1662 happens^ when it's cold out inside?
 1663 Zale: (((Zale extends her right arm, hand, and fingers fully to her right))
 1664 [They get frozen.
 1665 MB: They get frozen? Maybe, but they probably get cold, huh? Yeah, all: of the
 1666 —do you guys know that we have blood inside of us and water inside of
 1667 us?
 1668 Multiple: Yes, yes
 1669 MB: You know that cedars have something called #sap# it's kind of like their
 1670 blood? But they have wa:ter, (.) and when it's rea:lly cold out (.) <it
 1671 doesn't move so fast> so they grow <slow::er:> >in the winter time.

1672 And then the sun comes out and we get more rain<n< (.) a:nd I think we::—

1673 ^I don't know, [what do we think happens if we get more:: sun and more:

1674 rain and more:

1675 nutrients from the soil?^

1676 [((Pearl, Olive, and Miguel all rise to a standing crouch))

1677 ((Tommy, who was standing, crouches down))

1678 UY: You get tall.

1679 MB: [You get taller^

1680 [((MB and Charlene start to rise up to crouched standing position, arms

1681 still extended left to right))

1682 [((Pearl and Olive stand up straight; Zale rises to crouched standing

1683 position))

1684 MB: Yeah, I was kneeling down.

1685 UY: Here we go!

1686 MB: ^So how old are we now?^

1687 [((Sal and Marvin stand up straight))

1688 Miguel: [We're: about a teenager.

1689 MB: You think we're a teenager okay:

1690 ^So we think we keep doing this—so what happens when we get to be

1691 like #70#?

1692 Miguel: We're gonna be all the way up [((Miguel points to tall trees bordering the

1693 field))

1694 [to like those trees

1695 MB: So ^what do you think^ it was like here <70 years ago>? Or maybe <150>

1696 years ago?

1697 David: Or billions or thousands of years ago.

1698 MB: Do we think red cedars were—one red cedar li-tree lives for (.) a billion

1699 years?

1700 Miguel: mm maybe

1701 MB: mm I don't think so. I think maybe like 150 years to 200 years is how long

1702 cedars grow. So ^imagine^—

1703 Pearl: (inaudible) um into a ^300^ (.) years

1704 MB: mm there are some that grow ridiculously long >you're right< but usually

1705 don't=

1706 Charlene: =(((Charlene extends arms left to right at waist, palms facing upward))

1707 =[But what happens when they get #really really# old? Do they just sort of

1708 (.) get (((holds both hands facing each other face height imitating being

1709 stuck))

1710 [#stuck# there? >Do they stay like that forever? Do they just kind of

1711 freeze?< What happens to them?

1712 ((Charlene starts leaning to her right))=

1713 Pearl: =[[I think they start

1714 =(((Pearl extends arms left to right, hands waist height, slight bend at

1715 elbows))

1716 ((Pearl slowly leans her whole upper body to her left))

1717 Charlene: You think <they tip> (..) [^over^?

1718 (((MB extends arms left to right at waist, with slight

1719 bend at elbows, and leans to her

1720 left))

1721 Zale: No, I think they (inaudible)

1722 MB: I feel like (((starts swaying upper body back and forth, arms still

1723 extended))

1724 [may:be they start <moving like this> before they get really

1725 —everyone seen a (((MB extends arms fully at shoulder height))

1726 [big cedar?

1727 Miguel: **(((Miguel extends arms fully at shoulder height and looks from MB to the**
 1728 **trees where MB is looking))**

1729 UY: **[uh-huh**

1730 MB: **(((MB rotates upper body to her right to look at trees on border of field))**
 1731 **[I wish we could go put our arms around a big cedar.**
 1732 **Next time (.) some time ((inaudible)**

1733 Pearl: **[(inaudible)!**

1734 **(((Sal and Marvin extend arms fully at shoulders))**

1735 MB: **((turns to look at Pearl)) I know! We have hu:ge cedars, and I bet we**
 1736 **would**
 1737 **take like ((bows out extended arms and steps into the circle))**
 1738 **[#six of us# to get our arms all: the way around them.**
 1739 **(((drops arms and steps back to rim of circle and then raises arms back**
 1740 **up**
 1741 **fully extended left to right at shoulders))**
 1742 **[(.) So: big! If I felt like ((raises arms full extension in a V and rises onto**
 1743 **her toes))**
 1744 **[that big**
 1745 **—can you all make yourselves feel [like you're a <really big> cedar tree?**

1746 **(((Charlene emulates MB))**

1747 **((the rest of group except Tommy follows))**

1748 **((Pearl jumps up in full extension and makes ecstatic sound))**
 1749 **Oh so:: strong!**

1750 David: **Like this?**

1751 MB: **Yeah# (.)**
 1752 **So: strong! I feel like the wind can't blow me over anymore.**
 1753 **Can you make yourself feel #that strong# [so wind can't move you?**

1754 **(((Pearl repeats her jump and**

1755 **ecstatic sound))**

1756 **((multiple youths emulate Pearl))**

1757 **((various sounds and possibly words of playful, joyful affect are**

1758 **produced))**

1759 **MB: Yeah ^like that^ (..) All right.**

1760 **((Gabe approaches from off-scene))**

1761 **#We're <really** **(((MB looks to Gabe))**

1762 **[strong big cedars that the wind can't blow over anymore#**

1763 **Gabe: (((Gabe makes blowing sounds while holding arms forward into o-space))**

1764 **(((overlapping excited talk from group))**

1765 **MB: ((looking at Gabe and stretching right hand open)) #I block you# (.) #I**

1766 **block you#! ((laughs))**

1767 **Zale: and then um and then [your leaves will start to fall off**

1768 **Miguel: [(inaudible)**

1769 **MB: ^They do! Cedar trees [(inaudible)**

1770 **Multiple: [(inaudible)!**

1771 **Miguel: I imagine (inaudible)!**

1772 **UY: our fingers are falling**

1773 **Pearl: (((stops flickering fingers and holds them in a fist))**

1774 **(((looking at MB)) Our fingers are falling so take away your fingers.**

1775 **MB: Oh, our fingers—[our needles are falling? That what you meant, too?**

1776 **(((Gabe leans into circle and makes blowing noises))**

1777 **^They were going to start falling off a little bit?^**

1778 **(((Marvin falls onto his back on the ground))**

1779 **(((overlapping excited talk))**

1780 **Marvin: [(inaudible) I fell over**

1781 **MB: ^You remember how we started?^ (.) ^How'd we start?^**

1782 Pearl: **[((Pearl drops to the ground and gets in seed icon position))**

1783 Marvin: **[I fell o:ver:!**

1784 MB: **Yeah.**

1785 **[((Sal and Olive fall to the ground and get in seed icon position))**

1786 **[^Well, where did that little: (.) cone, that little seed come from?^ (..)**

1787 **I think it came from a <really big, strong cedar> that decided to go like**

1788 **this**

1789 **((MB makes wind in branch noises while swaying left to right with arms**

1790 **fully extended**

1791 **side to side and wiggles her fingers)) <and drop them everywhere:>**

1792 Marvin: **You know that I fell o:ver::?**

1793 Charlene: **[#You fell over?#**

1794 MB: **[^You fell over?^**

1795 **^You know what you might be then?^**

1796 **>Maybe you're gonna be a nursery log< and we can start a new one.**

1797 **I'm gonna be a <new seed> right on your legs.**

1798 **[(.) I'm gonna go like this, ready?**

1799 **[((MB bends down over Alvin's legs and curls into a fetal position**

1800 **embodying the seed icon established earlier))**

1801 **(.) ^What do I need? What [do I need?^?**

1802 Charlene: **[We need some [water!**

1803 Pearl: **[WATER::!=**

1804 **=((Pearl, standing over MB, leaps into air throwing her arms above her**

1805 **head and then sways her arms left to right above MB's back))**

1806 Charlene: **#oh Pearl is giving the water#**

1807 MB: **[^And what else do I need?^**

1808 **[((Most of the group walks toward MB, forming an F-formation around her**

1809 **and Marvin))**

1810 Gabe: **(((As Gabe walks toward MB, he tosses both arms forward))**

1811 **[Swoosh!**

1812 **(((Miguel extends hand over MB))**

1813 Charlene: **#[You need some sun!# Miguel are you the sun?**

1814 Gabe: **(((Gabe fully extends arms and shakes both hands high above MB))**

1816 **[Here's-here's sunlight!**

1817 **(((Miguel fully extends arms and holds both hands high above MB))**

1818 **(((Pearl, Zale, and Miguel all hold their arms fully extended over MB))**

1819 Charlene: **[You're the sunlight? oh-hoh:!(.)**

1820 MB: **(((MB raises to fully upright on her knees, arms fully extended left to right))**

1822 **[I sprouted!**

1823 **(((Olive jumps on MB's extended left arm))**

1824 Charlene: **#Oh no! Olive the [deer#**

7.29.15 Wednesday Gabe LARP Launch Transcription

1825 Gabe: **Alright guys. ohwhh.**

1826 Priya: **David**

1827 Gabe: **David (.) come on in. (...) Alright guys, I'm gonna talk to you about for the**

1828 **stuff for a little minute then we're gonna do (.) #a bit of play and pretend**

1829 **around here. (.) There isn't enough playing going on, [I think#**

1830 **(((Ninja leans up and forward, covering mouth))**

1831 Ninja: **Yeah there isn't.**

1832 Gabe: **exactly that.**

1833 **[we're gonna play some [more.**

1834 ND: **[whooh [I got the biggest blackberry.**

1835 Gabe: **After the biggest blackberry gets consumed. So: [(...)**

1836 Group: **[(inaudible)**

1837 Gabe: eyes and ears over here [guys. (...)]

1838 UY: [blackberry fight!]

1839 [((Ninja reaches over two people to his right to

1840 Dave))

1841 Dave: ^hahaa^

1842 Gabe: So: (..) I wanted to talk to you a little bit about what you guys did on

1843 Monday. >You guys remember when we got to go play on Monday?<

1844 UY: m-hmm

1845 Gabe: [((Gabe shrugs his shoulders))

1846 [Wha- What did we do?

1847 Ninja: We had fun.

1848 Gabe: (.) (smiling) Can we be more #specific#? [(..)

1849 Ninja: [(inaudible)

1850 Gabe: When we were: (.) #being Cedar^#? (..)

1851 UY: yeah:

1852 Gabe: [we had remember^ (.)

1853 UY: [we were a cedar tree

1854 Gabe: when we did, we did the: Grandma Cedar story?

1855 UY: Yeah.

1856 Gabe: Okay, so and then we got to be:: (...) <cedar people> (.) essentially. (.)

1857 right?

1858 Dave: Yeah (.) and I fell over and got covered in leaves.

1859 Gabe: [((Gabe points at Dave))

1860 [Exactly so

1861 Trent: [((Trent raises and drops both hands into grass twice))

1862 [Yeah:: a nurse log

1863 Gabe: [((Gabe looks to his notes then looks at group again))

1864 [(..) ^Did you have fun doing that?^

- 1865 **Multiple:** Yeah
- 1866 **Gabe:** So I wanna ask (((Gabe glances between notes and group))
- 1867 [ya—
- 1868 **UY:** yeah
- 1869 **Gabe:** (((Gabe gesticulates with his right hand to the beat of his words for whole
- 1870 turn))
- 1871 [so what some other thing like that is, if you're like (.) being in the role of::
- 1872 (.) the
- 1873 Cedar righ::t? (.) you're taking the #perspective of the Cedar# righ:t? (..)
- 1874 ^Why do you think something like that's important^?
- 1875 ((Gabe holds right hand down, palm open and facing group))
- 1876 **UY:** So we can see (inaudible)
- 1877 **Gabe:** (((Gabe continues holding right hand out, gesticulating to the beat of his
- 1878 words)) [^So we can see what's going on with the Cedar when they're
- 1879 going through their life cycle. What's important for them, what's going on
- 1880 with them^ right?
- 1881 **Group:** (((Several people point to the sky and Gabe looks up at the sky))
- 1882 [Eagle. Whoa. ((crosstalk several seconds)) HEY EAGLE! EAGLE:: COME
- 1883 HE^RE!
- 1884 **Ninja:** >We offer you a sacrifice!<
- 1885 **Gabe:** Kay (3s) so did that that (...) >so did that—was that helpful< did you guys
- 1886 get the feel like you were Cedar at that point?
- 1887 **UY:** No (inaudible)
- 1888 **Gabe:** (((Gabe points toward speaker))
- 1889 [That's fair. There is a (((Gabe holds one hand a few inches above the
- 1890 other))
- 1891 [spread of difference there,

1892 **(((Gabe holds his hands in front of torso and gesticulates with them to the**

1893 **beat**

1894 **his words throughout the rest of his turn))**

1895 **[and that's a really important thing that you still feel like a human being (.]**

1896 **but**

1897 **you're trying to learn about being in the #perspective# (.) of Cedar, right?**

1898 **So that's a huge thing.**

1899 **(((Gabe flips through his notes)) (...)**

1900 **UY: [(inaudible)]**

1901 **Gabe: (((Gabe resumes gesticulatory pattern as in prior turn))**

1902 **[Why is this important to do for the land and the [water?**

1903 **(((stops hands then starts))**

1904 **(.) And and the [plants?**

1905 **(((stops hands then starts))**

1906 **(.) Why would doing this kind of [perspective-taking [be important for**

1907 **them?**

1908 **(((stops hands)) [(starts hands)]**

1909 **((Gabe waits 21 seconds; there's side chatter but no group discourse))**

1910 **Gabe: Priya**

1911 **Priya: ^well plants (.) and animals are living too^**

1912 **((Gabe waits 7 seconds))**

1913 **Gabe: (((Gabe shakes right hand to beat of words))**

1914 **[^Do we speak the languages of plants and animals at this (((stops hand))**

1915 **[point?^**

1916 **Dave: yeah, don't talk at all (.) that's <the language>**

1917 **Gabe: (((holds both arms out in front of body slightly bowed))**

1918 **[But if we got in the space where (((holds left hand pointing to his chin))**

1919 **[we are**

1920 **(((moves left hand to beat of his words))**

1921 **[(.) thinking like the [plants and <animals> (..) does this help (.) [them^?**

1922

1923 **(((stops hand))** **(((stops**

1924 **hand))**

1925 **Therese: Yeah, would you wanna be stepped on if you were a plant? (.) Or an**

1926 **animal? If you think about it (.) maybe you'll be more gentle when you're**

1927 **walking through the forest. (.) What about all those anemones on the**

1928 **beach today? (.) What about the blackberry bushes that got pushed out of**

1929 **the way and the ferns and the nettles that got pushed aside or picked?**

1930 **Dave: (((Dave points at someone))**

1931 **[he cut 'em.**

1932 **UY: the the um the nettle—**

1933 **Therese: Do you think that Cedar tree would wanna be cut down or maybe we'll**

1934 **give tha:nks or (.) an <offering>?**

1935 **UY: Yeah:**

1936 **Gabe: So this is important (.)(((leans forward))**

1937 **[because we don't (((pats the grass with right hand))**

1938 **[hear the grass <so well>, we don't**

1939 **understand what the birds are saying <so well>. But if we put ourselves in**

1940 **that space (.) and we got to (.) be: (.) and play the part of these animals**

1941 **and plants (.) and understand where there's being, (((pats grass with right**

1942 **hand)**

1943 **[what they're seeing >how they're seeing**

1944 **it< (.) this is gonna be a big thing that's *particularly important* (.)**

1945 **(((raises right hand and gesticulates to beat of each word))**

1946 **[to help us understand (.)(((rubs right hand in circles in grass))**

1947 **<what makes those places where they're living**

- 1948 healthy>(.) (((lifts hand in reverse direction on grass))
- 1949 [or not healthy (.) right? So: (.) I wanna get (.)
- 1950 (((bows arms out and makes wide circle))
- 1951 [us all into, how many are here (.) give me a head count. (...) but we're
- 1952 going to get into, split up into groups and I want (.) to be (.) #different
- 1953 plants than Cedar# (.)
- 1954 We've got we've studied now multiple plants, right? Can anybody name
- 1955 like at least (((holds up 3 fingers))
- 1956 [3 plants that we've studied thoroughly?
- 1957 (((Gabe points at Dave))
- 1958 [Yes.
- 1959 Dave: Cedar, um uh, horsetail, um uh (.) nettle!
- 1960 Priya: You guys can throw out, just throw out names of plants that you
- 1961 (inaudible)
- 1962 ND: raspberry pomegranate
- 1963 UY: Nettle, cedar, ((inaudible)
- 1964 Gabe: ((alright, you guys have learned a lot about different plants.
- 7.30.15 Thursday LARP Priya Small Group Transcription
- 1965 ((Priya is facing Jake and Alvin, each standing on either side of her in an
- 1966 open-L))
- 1967 Priya: Do we wanna be our plant relative, or do we want to be something else?
- 1968 Alvin: >Something else<
- 1969 Priya: Something else? You want me to go get one of those sheets?
- 1970 Alvin: #<Something el::se>#
- 1971 ((Priya walks toward Gabe))
- 1972 Priya: [I'll get one of these.
- 1973 (((Gabe hands her a packet))

1974 ((Priya returns to face Jake and Alvin, and Regan who is crouched on the
1975 ground behind and facing them, examining the land with her hands,
1976 forming an oddly shaped four-person o-space))

1977 Priya: [Okay

1978 Alvin: [I already know what I want to be.

1979 Priya: What?

1980 Alvin: Blackberry bush

1981 Priya: (((shuffles through packet, looking down at sheets of paper with diagrams
1982 of PNW plant relatives, continues to flip through packet))

1983 [U:m how about salmonberry?

1984 Alvin: no

1985 Priya: [How 'bout—

1986 Jake: [Salmonberries are good

1987 Alvin: Blackberry bush!

1988 Priya: (((Priya holds papers up))

1989 [Well let's do one of these <^nettle^> (.)

1990 Jake: Well we're always blackberry bush.

1991 Priya: What's your plant relative?

1992 Alvin: (.) Snowberry

1993 Priya: Snowberry? (.) Ooh yarrow, I saw some of that today (.) <salmonberry:>

1994 Regan: I got

1995 (((Alvin walks backward and controlled falls to the ground on his back))

1996 Priya: [Fireweed (.) horsetail [(.) hmm

1997 (((Regan stands up and walks to group joining o-
1998 space))

1999 Priya: Hey you know salmonberry (.) <there's a berry> >do you wanna do
2000 salmonberry?< ((looks to Alvin)) You wanna do blackberry?

2001 Alvin: Blackberry

2002 Priya: ((looks to Jake and Regan)) Do you guys wanna do Blackberry?

2003 Jake: I wanna be salmonberry

2004 Alvin: I wanna be both

2005 Regan: Salmonberry

2006 Alvin: I can poke people now!

2007 Priya: You know (.) (((turns away from group, walks to Gabe, returns packet to
2008 him)))

2009 salmonberries have spikes too (..)

2010 Alvin: where are all: the salmonberries?

2011 Priya: Here (.) >you can be blackberry, too< (.) come on.

2012 ((Alvin gets up and the group starts walking together for 50s))

2013 ((Priya looks back at Gabe))

2014 Priya: ^Should I (.) take another one or^—I guess everyone's good. Let's go (.)
2015 everyone's fine.

2016 ((Priya leads group in walking along the edge of the open field next to the
2017 forest, away from the other small groups))

2018 Regan: can we stay in the sha:de?

2019 Priya: Yeah

2020 Alvin: That's the (inaudible) place for me up there

2021 Priya: Where?

2022 Alvin: Blackberries like sun

2023 Priya: Blackberries like sun? (.) How 'bout salmonberries, do salmonberries like
2024 sun?

2025 Regan: um [(.) not really

2026 Jake: They like shade

2027 Priya: They like shade? ^Hmm^

2028 Alvin: I think they like sun so they can grow.

2029 Priya: ^Sun so they can grow^ How 'bout (.) can you be: (.) [can you have both?

- 2030 Jake: [blackberries are
- 2031 mostly under the shade]
- 2032 Priya: Can you have <both sun and shade>?
- 2033 Alvin: Mm-hmm (affirmative)
- 2034 Jake: yeah
- 2035 Priya: Yeah?
- 2036 Jake: [you could be like (inaudible)...
- 2037 Alvin: [like you can be (.)]((standing in the sunlight, Alvin steps a foot into a tree
- 2038 shadow))
- 2039 [like here like my foot's in the shade (.) >but the rest of
- 2040 my body is in
- 2041 the sun< (((Alvin steps both feet into the shade))
- 2042 for [it's in the shade and some of it in the sun. [(inaudible)
- 2043 Priya: [Yeah? [Hmm
- 2044 Priya: So what if you start out as just like a little (((sits down on grass in shade
- 2045 near boundary
- 2046 between field and thick flora))
- 2047 [baby salmonberry where you're
- 2048 like this big?
- 2049 [(.) or a little baby salmonberry
- 2050 Multiple: (((Regan and Jake both sit down side by side forming a shaded o-space
- 2051 with Priya))
- 2052 ((Regan keeps upper body upright and Jake lays upper body on ground
- 2053 with knees pointed up))
- 2054 Priya: [an:d >you're just a tiny little baby<
- 2055 Alvin: (((As he makes a nonvocalic playful noise that sounds like "weee", Alvin
- 2056 sits down and falls backwards about 10 feet behind Regan and Jake, in
- 2057 the sun, and then curls up into fetal position and tips to his side))

- 2058 Priya: (((looks down at notes on salmonberry page))
- 2059 [an::d (.) you start off as what (.) >a seed<?
- 2060 Regan: uh huh
- 2061 Priya: Yeah, you start off as a [see:d and you sprou:t (.)=
- 2062 Alvin: [I'm gonna be a seed!]=
- 2063 =(((Alvin lifts upper body up from seed position, maintaining lower body
- 2064 in fetal position))
- 2065 Priya: =[an::d let's say you sprout like right in like this <sunny slash shady>
- 2066 spot. *It's like both sunny and shady.* And then you start growing a little
- 2067 bit and you're like <really young>
- 2068 Priya: What do you—when you're like really young—(..) has anyone ever hung
- 2069 out around babies before?
- 2070 Regan: Uh huh
- 2071 Alvin: I've seen a [baby=
- 2072 Jake: [yeah
- 2073 Alvin: =[before
- 2074 Priya: =[yeah have you ever hung [out with a baby?
- 2075 Alvin: [I've seen a baby that was (.) lived for like (.)
- 2076 maybe (...) two weeks or one.
- 2077 Priya: Oh (.) that's
- 2078 Alvin: Or maybe just (.) or maybe just 3 days old.
- 2079 Priya: So you've seen like a little th-baby, what do babies do?
- 2080 Regan: Cry
- 2081 Alvin: Cry
- 2082 Priya: Yeah, what else?
- 2083 Jake: >cry crawl around<
- 2084 Priya: Crawl around—what if they can't even crawl yet?
- 2085 Regan: They just like [(.) they don't do much.

- 2086 Alvin: [they just like sit there
- 2087 Regan: They just like [cry and...
- 2088 Alvin: [they just like sit there and cry
- 2089 Regan: be-uh fed=
- 2090 Alvin: =they just [sit there and cry
- 2091 Priya: [FED
- 2092 Alvin: I know why they cry=
- 2093 Priya: =why?
- 2094 [((Priya looks over to far right of group where Rose approaches to begin
- 2095 filming))
- 2096 Alvin: [Because they think it's unfair that everybody else older than them can
- 2097 walk but they
- 2098 can't
- 2099 Priya: So maybe they get like <frustrated>
- 2100 Jake: [and jealous
- 2101 Alvin: [they can't walk but other people can
- 2102 Priya: But Regan you said that they also get fed a lot too. [((turns to Rose))
- 2103 [Babies—you've had a
- 2104 baby, babies
- 2105 eat <a lot>. Babies need—>what do we get< from our food?
- 2106 Regan: um:: (.)
- 2107 Alvin: >milk<=
- 2108 Jake: =protein
- 2109 Priya: >yeah we get milk<, we get protei:n
- 2110 Regan: Carbs^
- 2111 Priya: Carbs, we get lots of good energy, right? We need all this energy. So if I'm
- 2112 like a little <baby salmonberry> I need (.) a lot of energy, right^? Lots of
- 2113 energy.

2114 So here we are, we're our little baby salmonberries.

2115 Alvin: And blackberries

2116 Priya: And blackberries yeah, we got [one blackberry over there.=

2117 (((Alvin raises right thumb pointing at

2118 himself and Priya points to Alvin))

2119 (((Jake sits upright and then hugs upper body into raised knees, seed

2120 icon))

2121 =[And you probably want need a lot of energy right? Because you're like

2122 really little, you gotta <start growing> <you gotta start getting up there>

2123 You can't grow if you don't have any [energy right?

2124 Alvin: (((Alvin moves into seed icon

2125 position))

2126 [I'm a seed!

2127 Jake: ((Jake falls over, still in seed position))

2128 Priya: So you're a seed we're all like little seeds we (((rolls to back and side in

2129 seed position))

2130 [start off as seeds. And then:

2131 we're in the=

2132 Alvin: [seed seed

2133 Priya: =dirt (.) [and you're getting the dirt—^what's in the dirt that's good

2134 for us?^

2135 (((Alvin roles back onto back, still in seed

2136 position))

2137 Alvin: (((begins extending arms outward in sprouting icon))

2138 [sprout seed

2139 Priya: What's in the dirt?

2140 Regan: Ants

2141 Alvin: Worms

2142 Priya: **Wor:ms**

2143 Alvin: **[((drops hands back to knees))**

2144 **[Soil**

2145 Priya: **Soil**

2146 Jake: **Nutrients**

2147 Priya: **Nutrients worms are eating [(.) decay**

2148 Alvin: **[seeds other seeds**

2149 Priya: **other seeds (.) and so we're getting all these nutrients and we're getting**

2150 **(..) so what else do we need <to grow>?**

2151 Alvin: **Roots**

2152 Priya: **Roots? Well how do we start growing our roots? What do we need?**

2153 Regan: **[umm**

2154 Alvin: **[((points left index finger high up into the air))**

2155 **[WATER**

2156 Priya: **Water**

2157 Alvin: **SUN**

2158 **[((points left index finger into air again, slightly to the left and up))**

2159 Priya: **We need some sunlight and then [what starts happening?**

2160 Alvin: **[sun and sha:de**

2161 Regan: **[((joins hands palm to palm and raises in front of her face))**

2162 **[We start to [sprout^**

2163 Jake: **[((from seed icon position on his side, Jake raises left hand upward,**

2164 **spreading fingers far apart))**

2165 Priya: **We start to sprout [up a little bit.**

2166 Jake: **[((Jake sits up, arms loosely wrapped around knees**

2167 **loosely pulled into chest))**

2168 Regan: **[((Regan begins rising up onto her knees while opening hands outward**

2169 **and raising above her head))**

2170 Jake: (inaudible) sprout. I was laying on the ground before=
 2171 Priya: =and now you sprouted up and like you popped up?
 2172 Jake: ((nods head with a kind of shrug))
 2173 Priya: And you're still getting nutrients, [you're still getting water, you're still
 2174 getting=
 2175 Alvin: (((Alvin starts making nonverbal growing
 2176 noises as he begins raising his arms))
 2177 Multiple: =(((Regan starts fully extending arms up and outward, Jake gets up to
 2178 crouching on his
 2179 feet, and Alvin stands up while stretching arms out side to side))
 2180 Priya: =[sun:, <you're still growing> *and then your leaves [start coming out.*=
 2181 Alvin: [I am big bir:d
 2182 Priya: =[Your leaves start popping out to the side (.) and then you start
 2183 <growing>
 2184 Regan: =(((Regan stands up with arms still outstretched))
 2185 Alvin: BIG BIRD!
 2186 Priya: Oh: and then you start spreading and I kinda want some sun right^ but
 2187 maybe: too much sun (.) these leaves start to shrivel a little bit
 2188 Alvin: So we have some shade too.
 2189 Priya: And my leaves are in a sunny and shady spot, *they're kinda doing okay,
 2190 so they're growing* (.) so I'm sprouting some more leaves over here,
 2191 right?
 2192 Jake: (((begins to rise up, though body is still curled))
 2193 [I'm curling up.

7.30.15 Thursday LARP Hike Transcription

2194 ((Dale who is holding a hula-hoop, Ninja, and Marvin walk side by side, in
 2195 that order from left to right, up the slow incline of a curving paved road
 2196 bordered by forests on either side))

2197 ((Dale is talking and angling his face toward the o-space of the moving f-
2198 formation shared with Ninja and Marvin, whose faces appear to be
2199 looking forward through the o-space but not at Dale to the left))
2200 ((Dale is still talking and Marvin turns his head to his left toward Dale))
2201 ((Ninja turns his head to his left and toward Dale))
2202 (((Marvin leans his whole body leftward and begins to extend his left arm
2203 across the front of Ninja's embodied perspective of the o-space and
2204 points low to the left in the forest and slightly up the path as they pass by
2205 it))
2206 ((Dale turns his head to the left and appears to look in the direction
2207 Marvin is pointing))
2208 (((Marvin continues to point for 7 seconds))
2209 (((As Marvin points first Dale takes a step that veers his body to the left of
2210 Ninja who immediately begins veering left too))
2211 ((The whole group drifts to the left several feet toward where Marvin has
2212 been pointing in the forest))
2213 ((All three appear to be talking))
2214 ((Marvin points again to something to the left, low, and in the forest))
2215 ((Dale and Ninja look where Marvin is pointing))
2216 (((Dale bounces the hula-hoop on the ground without letting go))
2217 (((Marvin turns his head and appears to look far off to his right))
2218 (((Marvin quickly points his left hand to the right and slightly up
2219 the path))
2220 **Marvin:** [—LACKberries
2221 **Dale:** [(inaudible)
2222 **Marvin:** [(inaudible)
2223 **Dale:** [(inaudible).
2224 **Marvin:** Yay.

2225 Dale: Some places—

2226 Marvin: More blackberries are growing.

2227 ((Dale looks up to the right))

2228 Dale: #we'll destroy them!# ((Dale bounces the hula-hoop off his forehead and

2229 makes an exploding sound))

2230 ((Dale and Ninja begin to drift several feet apart from Marvin))

2231 Ninja: Oh, I-I know one thing that (inaudible). (.) ^You know those American vine

2232 things^?

2233 Dale: Yeah

2234 Ninja: Ok (.) We-we'll be one of those.

2235 [(inaudible)]

2236 Marvin: [(Marvin steps loudly and playfully back up to Ninja and Dale)]

2237 #time to raid these (inaudible)#

2238 ((Marvin raises arms in plant icon and runs ahead of the group and close

2239 to the boundary between the gravel and the edge of the forest))

2240 Dale: [(Dale very briefly places the hula-hoop around Marvin's head)]

2241 [(inaudible)]

2242 Ninja: You are no longer a blackberry

2243 Marvin: Ok (.) now what am I?

2244 Ninja: (inaudible)

2245 Dale: [eel grass

2246 [(Dale throws arms up in air and smiles)]

2247 ((group laughter))

2248 ((Marvin walks with arms held up and steps wide and long))

2249 Dale: eel grass (inaudible)

2250 Marvin: #New blackberry# ((in a sing-songy voice)) gro::ve

2251 Ninja: Okay we'll be the American Vine. (inaudible) American vine is an evil and

2252 dangerous thing.

2253 Dale: eel grass (.) >our only purpose is to be eaten (inaudible)< (.) <(inaudible)>

2254 Ninja: ((laughs))

2255 Dale: (inaudible)

2256 Marvin: I think they call—I think blackberries are black—I think blackberries are

2257 ((inaudible)—

2258 UY:

2259 ((inaudible)

2260 Ninja: ((Ninja turns to and points at Marvin))

2261 [You're racist!

2262 (everyone giggles)

2263 Marvin: I think blackberries are black because they ((inaudible)

2264 Dale: ((RACIST)!

2265 Marvin: I think blackberries are black because they're evil. (.) Righ^t?

2266 Dale: That's racist. (in laughing voice) that's really racist.

2267 ((5 seconds silence among the group))

2268 ((crosstalk from other hiking groups passes by))

2269 Ninja: Why-why are they black?

2270 Dale: Typical blackberries

2271 Marvin: Yes and they—and they're evil. (...) All evil—

2272 Dale: I think it would be called—I think we would call it—^you know how like

2273 black and red are the color for evil^

2274 Marvin: [Yeah: black and red, black and red (inaudible)

2275 Ninja: ((singing) >We (.) are (.) fer^ns dun dun-dun dun<

2276 Dale: ((making eye contact with Ninja)) (singing) We (.) are (.) fer^ns

2277 [dun dun-dun dun

2278 Ninja: [dun dun-dun dun

2279 Marvin: What are: ferns?

2280 Ninja: There's sword fern [(.) right there (.) to the right

2281 **(((points with his left hand to the right))**

2282 **((Marvin looks to the right in the direction Ninja has pointed))**

2283 Dale: **Sword Ferns— (inaudible)**

2284 Marvin: **yeah-#YEAH, but us blackberries take over the ferns# (..)**

2285 **[Ya Ya Ya! #I'm taking over you#!**

2286 **(((Marvin extends arms in plant icon and stomp walks toward Dale and**

2287 **Ninja))**

2288 Ninja: **(((Ninja whispers to Dale and then runs ahead))**

2289 Dale: **No! ((Dale runs ahead to Ninja))**

2290 Marvin: **(((Marvin runs after Dale and Ninja))**

2291 **[(..) #I'm taking you over#. I'm devouring you.**

2292 **((10s pass of inaudible talking and laughing while walking up ahead of camera))**

2293 Marvin: **Okay:: can you guys slice off (inaudible) for humans?**

2294 Ninja: **Okay yeah. Sword ferns really have a (inaudible)**

2295 Dale: **(inaudible). You can use a sword fern (inaudible). Yes, there's one sword.**

2296 **(Inaudible) (crosstalk) You slice through the air**

2297 Ninja: **Imagine a (crosstalk)**

2298 Marvin: **You mean that #<the tale of the heroic sword ferns>#?**

2299 Dale: **Yes. There's one sword fern, that is able—if you hold it correctly**

2300 **—huh?**

2301 **((inaudible exchange between Ninja and Dale))**

2302 Dale: **Run!**

2303 Marvin: **(((Marvin begins stomping on Dale and Ninja's shadows))**

2304 **[I'm stepping on your shadow (inaudible). Boom boom boom. (inaudible)**

2305 **face!**

2306 Dale: **(inaudible)**

2307 Marvin: **Shadow [(inaudible)!**

2308 Ninja: [Okay, you have to be a—you have to be a a new (inaudible) plant.

2309 What are you gonna be?

2310 Marvin: I'm blackberry! Blackberries

2311 Ninja: No you have to be a new one.

2312 Marvin: No. Okay I'm the heroic sword fern.

2313 Ninja: No you have to choose a new (.) one.

2314 Marvin: How about (.) how about:::t [(...) how about the <heroic> (..) pine trees?

2315 Ninja: [the stinging nettle

2316 Marvin: [((points up toward the sky))

2317 [They give air to humans.

2318 Dale: You could've—you could've been the <(defenseless?) nettle>.

2319 Ninja: I'm the (defenseless?) nettle, yeah. (crosstalk)

2320 Marvin: How about pine trees? They give oxygen to everybody in the forest.

2321 Ninja: (inaudible crosstalk) We're the guardians of the forest

2322 Dale: We can just be a type of like (.) um forest. One nettle (.) blackberry bushes

2323 are another [(inaudible)

2324 Marvin: [Okay I'm gonna be a nettle!

2325 Ninja: No you have to be something different=

2326 Marvin: =Blackberry

2327 Ninja: no not that you've already been that one

2328 Marvin: Why?

2329 Ninja: Because (.) you've already been a blackberry.

2330 Dale: You can have two people. Like, one person's nettle -

2331 Ninja: (inaudible)... We're keystone species so you have to...

2332 Marvin: Okay, what are keystone species? (crosstalk)

2333 Dale: Actually, the people who were here first (..) at the circle^ (.) were the ones

2334 that were keystone species -

2335 Marvin: [((Marvin points toward grass))

2336 [GRASS]

2337 Dale: inaudible

2338 Marvin: [(Marvin points toward trees)]

2339 [Trees]

2340 Ninja: Ah what kind of tree?

2341 Marvin: Can I be a palm tree?

2342 Ninja: Ah snake!

2343 Marvin: That's a <bungee cor::d>!

2344 ((several second break))

2345 Dale: [(singing the same sing-song melody as earlier)]

2346 We are bushes (.) dun dun-dun dun

2347 Marvin: I'm going to be a pine tree because

2348 [(points high up in the high sky, possibly toward trees and/or as tree

2349 icon))

2350 [they give oxygen to other plants.

2351 Ninja: What else do you do?

2352 Dale: Trees take in carbon dioxide, not oxygen. (.) They give oxygen.

2353 [(inaudible)]

2354 Marvin: [And they breathe in carbon <dioxi::de>

2355 (6 lines omitted)

2356 Marvin: So pine trees - so trees are keystone species. And they breathe in carbon

2357 dioxide and they breathe out ...

2358 Dale: Kind of. Certain trees are. Some trees can be invasive. Some trees can

2359 just be there because of that (inaudible)

2360 Ninja: And some trees can be (inaudible)

2361 Marvin: Can I be... Can I be that tree with the (pointing) - can I be a maple tree?

2362 (....) Cause maple trees can give maple and they breathe in carbon

2363 dioxide and they breathe out...

2364 Ninja: Oxygen

2365 Dale: I wanna be (inaudible). I shall be the stinging nettle.

2366 Marvin: Ahh...But that's not a keystone species.

2367 Ninja: Yes it is.

2368 Dale: Well they're - well yeah they kind of are, they protect the forest -

2369 Ninja: Yeah they give people some string to make cordage and they give people

2370 medicine. And they give people stuff [to eat] and they also contribute to

2371 the forest

2372 Dale: And they help (inaudible)

2373 Ninja: Yeah. They most definitely are a keystone species.

2374 Dale: Also they make sure that you look around instead of stepping everywhere

2375 so that you don't get stung for 5 hours.

2376 Ninja: Horsetail, look at the horsetail. [Our job is to (inaudible)]

2377 Dale: [You'll be a useless horsetail]

2378 Ninja: Horsetails are very good! (crosstalk)

2379 Marvin: Horsetails just hang around and stay still.

2380 Ninja: They are very good for medicine (.) and very yummy. (crosstalk with Dale)

2381 Super good for medicine.

2382 Marvin: Ah ha I'm a maple tree! Maple trees are better:! Maple tree is huge.

2383 (crosstalk with Ninja) I'm choosing the one that—the ones that can make

2384 maple. (crosstalk) It breathes in carbon dioxide

2385 Ninja: It doesn't matter, other trees do that -

2386 Dale: You have to name the exact genus and species.

2387 Marvin: Okay, I'll just be that tree up there, the pine cone tree.

2388 Dale: You mean this tree (pointing). I don't know what this tree's called.

2389 Ninja: Yeah it's a pine cone tree, all it does is drop pine cones (inaudible)

2390 ((Dale laughs))

2391 Marvin: No! It breathes in carbon dioxide and breathes out oxygen.

7.31.15 Friday LARP Finale Transcription

2392 Episode 1: Spring

2393 Alice: I'm turning into a doug fir.

2394 (5s)

2395 ((Amanda walks up to Charlene from behind and taps her shoulder.

2396 Charlene turns to her))

2397 Amanda: I'm an eagle.

2398 Charlene: [I outmaneuvered you (..) haha:

2399 (((Charlene spreads her arms in wing icons and walks away in non-linear

2400 movements))

2401 Alice: ((looking down at Marvin who's sitting on the ground at her feet)) He's a

2402 little salmonberry.

2403 Alice: I'm a doug fir, whatever you need (inaudible).

2404 ((Charlene jumps toward Alice and they both giggle))

2405 ((inaudible group talk for 6 seconds))

2406 Alice: [What are you?

2407 (((looking at Michael))

2408 Michael: I'm a deer

2409 Alice: A deer^

2410 Michael: yeah

2411 Alice: Okay

2412 Alan: #Spring::# #Spring::# [#Spring::# #Spring::# #Spri::ng::#

2413 Alice: [You can hang out, but don't eat

2414 (((points at Marvin's head and then holds her hand, fingers spreads,

2415 above Marvin's

2416 head))

2417 [that little salmonberry because (inaudible) right now.

2418 Michael: Oh: okay.

2419 Alice: (inaudible)

2420 Charlene: [(inaudible) our little eggs.=

2421 Alan: [#Spring::# #Spring::# #Spring::#

2422 [(#walking in role-play motions past the group#)]

2423 Alice: =[((Alice lifts up onto her toes and pushes her arms out farther))

2424 =[Yay:: we're growing taller and you guys are making eggs, and you're

2425 gonna be momma

2426 sparrows.

2427 Charlene: [(inaudible)

2428 Marvin: ((Marvin begins to rise up to a stand, extending arms, shoulder length, left

2429 to right))

2430 ((inaudible group conversation for 7 seconds))

2431 Charlene: (inaudible) eagle was trying to eat us.

2432 Alice: [Where's eagle?

2433 [(leans back and looks out beyond the group)]

2434 ((inaudible group conversation for 8 seconds))

2435 Alice: ((to McG)) [I'm a doug fir and I have some sparrows. You're welcome to

2436 join.

2437 [(looking at someone off-frame outside the group)]

2438 Trent: [Light rain light rain light rain

2439 [(sprays group with water from a spray bottle)]

2440 McG: [#Ooh I'm a baby coyote, I'd love to eat some sparrows.#

2441 [(McG hops by the group flinging both arms, bent at elbows, back and

2442 forth))

2443 Charlene: #Oh no one of my eggs fell out#

2444 McG: [WHOA whoa

2445 [(leaps toward Charlene's feet on all fours)]

2446 ((Charlene and Sally hold arms in baby holding icon and sway them left to
 2447 right))

2448 Episode 2: Summer

2449 Alan: I am <Summer> and I am <wilting> (((Alan touches Alvin's shoulder with
 2450 his hand))

2451 [everything.

2452 Alvin: ((Alvin ducks underneath a picnic table))=

2453 Alan: =(((Alan steps toward Gretchen arms extended))

2454 Gretchen: =(((Gretchen ducks under the picnic table))

2455 Alvin: =I'm a beavER::

2456 Alan: It's very hot. ((inaudible)

2457 Alvin: I am a beaver in the den.

2458 ((Alan walks away toward a new group))

2459 [(5s)

2460 Alan: I am very hot dry [Summer and I am wilting everything

2461 (((Alan touches ND on the shoulder with his hand as he
 2462 walks by him))

2463 Trent: (((Trent sprays Alan with water from a water bottle))

2464 [I am rain

2465 Alan: (((Alan touches Trent on the right shoulder with his right hand as
 2466 he walks by him

2467 [You will dry up before you hit the ground

2468 ((Alan approaches a group of four, with Alice and Priya lying fully on the
 2469 ground and McG and Kal standing above them))

2470 ((McG and Kal kneel down next to Alice))

2471 Alan: I am Summer and I am very [hot and dry::

2472 (((Alan touches McG and Kal on the
 2473 shoulders))

2474 Alice: I'm a nurse log, I'll protect every:ne.

2475 Priya: I am a dead beaver.

2476 Alan: (((Alan touches Priya's side with his hand))

2477 [I am making you (inaudible)

2478 Kal: ((looking up at Alan)) What are you:~? What are you?

2479 Alan: ((Alan turns and looks down at Kal)) I am hot, hot, dry: Summer:. I am hot,

2480 hot Summer.

2481 ((Alan continues walking toward Tess and Dale who are standing

2482 together, Tess's arms extended outward and Dale crouched beneath her

2483 right arm))

2484 Trent: Summer's here!

2485 Alan: I am hot, hot summer: ((Alan touches Tess's shoulders))

2486 ((Tess droops her arms))

2487 Dale: I cannot hide in a tree anymore.

2488 ((Alan touches Dale's shoulders))

2489 Dale: (I'm gonna go?) hibernate

2490 ((Alan walks away from Dale and Tess and toward a group of five))

2491 Alan: hot, hot summer:~. I am hot, hot dry summer I'm wilting [you:~.

2492 (((Alan touches

2493 Sally's arm))

2494 Law: Oh, ma:n [I was just a spore.

2495 (((Alan touches Charlene's shoulder))

2496 Charlene: Oh: [no:~

2497 (((Alan touches Law's shoulder))

2498 Law: I can't handle uh—

2499 Charlene: [You can't handle the drought?~

2500 Marvin: [(to Dale) Are you a bear?~

2501 Charlene: =~[drought we'll have nothing to eat.

2502 Marvin: =**[IT'S A BEAR:: A BEAR:: There's a bear over there he's a bear.**

2503 Alan: **I am hot, hot Summer and you are wilted (.)** **(((points all fingers toward the**

2504 **ground))**

2505 **[right there**

2506 **((Dale and ND have off-camera interaction))**

2507 Dale: **I am bear, yes**

2508 ND: **I was giving you a hug.**

2509 Dale: **I'm good, I-I don't need a hug anymore.**

2510 Charlene: **(inaudible) oh no we have to find a new home little sparrow.**

2511 **[Come on.**

2512 **(((Charlene turns away from group, starts flapping arms up and down))**

2513 Sally: **((Sally follows Charlene, flapping her arms))**

2514 ND: **((ND chases after Charlene and Sally))**

2515 Sal: **((Sal follows the group holding arms out to his sides, palms facing up))**

2516 ND: **Die little sparrow**

2517 Charlene: **Sparrows don't sting—nettles don't sting sparrows.**

2518

2519 ND: **<Sparrows don't sting nettles>**

2520 Therese: **((Therese is standing with her arms extended outward as the group walks**

2521 **by her))**

2522 **But nettles help protect the sparrow.**

2523 **((Alice is still lying on the ground on her side))**

2524 **((ND runs off. Charlene and Sally continue to flap for 15 seconds,**

2525 **approaching Alice nurse log—who receives several visitors—observing**

2526 **and not interacting with anyone)).**

2527 Charlene: **((to Trent)) Hey rain**

2528 ((Ten people are standing in the immediate area all interacting; Charlene
 2529 and Trent have an inaudible conversation for 10 seconds, as she and
 2530 Sally stand side by side flapping their arms))
 2531 Trent: (((points to Priya))
 2532 [there's a salmonberry
 2533 Charlene: (((points to Priya))
 2534 [(inaudible) a beaver now
 2535 Priya: ((facing another player)) I was a beaver. I died and now I'm a salmonberry.
 2536 ((Charlene walks over to Priya and Sally goes with her; they start to peck
 2537 at Priya with all their fingers and nibble from their fingers))
 2538 Episode 3: Winter
 2539 ((Marvin and Daniel are sitting upright on the ground; Charlene and Sally
 2540 are standing to their left))
 2541 Charlene: [We store energy for the Spring.
 2542 (((Charlene crouches down to the ground into seed icon and Sally
 2543 emulates her))
 2544 ((Marvin crouches down to seed icon and Daniel stands up))
 2545 MB: (((MB walks by))
 2546 [#Shwooo, Winter#
 2547 Marvin: Guys, this is salmonberry seed.
 2548 UY: What are you?
 2549 Marvin: Guys, this is salmonberry seed.
 2550 Charlene: Right here:?
 2551 McG: Are there any berries?
 2552 ((Charlene, Marvin, and Sally all look up at McG))
 2553 Charlene: We need spring to come.
 2554 ((Dale walks onto scene))
 2555 Dale: Coyote! grrr

2556 Regan: [Spring time now!

2557 [((Regan sprays water on them))

2558 Charlene: [(inaudible) oh no!

2559 [((Charlene buries her head into her crouched position))

2560 Sally: [No::

2561 ((Marvin and Sally bury their heads into their crouched positions))

2562 Marvin: I'm a salmon berry seed.

2563 Charlene: We're little gameaphytes um we're the little—the little seeds for the um (.)

2564 for the sword ferns. We've just now taken root.

2565 Marvin: Is it summer now:?

2566 Charlene: We're dormant. We're waiting.

2567 Marvin: Can you give me some water? Because I'm a new salmonberry.

2568 Charlene: I don't have any water. I'm just <#poor little frozen#> (..)

2569 Sally: We're fro:zen

2570 Charlene: yeah, we're frozen (.) in the winter.

2571 Marvin: Yeah. But I'm a seed. (.)

2572 Charlene: We're deep underground (inaudible) (..)

2573 Marvin: ANYONE HAVE SOME WA:TER::?

2574 I'M A SALMONBERRY SEED I NEED [water.

2575 [((Marvin buries his head into his

2576 crouched position))

2577 Charlene: #We need some water too. We're so thirsty:#

2578 (...)

2579 Marvin: We need rai::n

2580 Charlene: #We need spring:#

2581 Dale: ((walking by the group)) I brought fire.

2582 Charlene: [Oh:: (..)

2611 ((Olive walks up close to Charlene, stands between Charlene and the
 2612 camera, and they have an inaudible conversation))

2613 Rose: This little salmonberry might.

2614 ((Alice walks toward the group))

2615 (((Rose points to Marvin who is crouched on ground in seed icon))

2616 Charlene: [This little salmon—

2617 (((Charlene points to Marvin))

2618 this salmonberry [(.) is [growing

2619 Alice: [Alright, salmonberry I [will protect you from the sun.

2620 Marvin: [I'm a seed.

2621 [I'm a salmonberry.

2622 (((Olive kneels down over Marvin))

2623 Alice: Alright, I'm gonna protect you from the sun too. (.) Oh, you good job. You

2624 found some shade.

2625 Olive: I got all the salmonberries on you because I'm a squirr:el.

2626 (((Olive starts waving her arms))

2627 Alice: [Oh: [Well. (...) Are you gonna grow tall:^ or did you get pretty damaged?

2628 [..

2629 [I'll protect you.

2630 (((Olive runs off))

2631 Tommy: [Hey look! (.)

2632 (((Tommy runs up a few feet behind Alice))

2633 [I'm a salmonberry.

2634 (((Marvin stands up directly in front of Alice))

2635 Alice: ((To Tommy)) You're a salmonberry?

2636 Marvin: [Look I'm taller

2637 (((Marvin extends arms out left and right))

2638 Alice: [Oh goo:d.

2639 Marvin: [(..) and (.) growing big. (.) I'm a growing berr:ies

2640 Alice: You should go protect some nettle and some horsetail. I think they need

2641 some protection.

2642 ((Marvin runs off camera))

2643 Marvin: [ANYONE WHO'S NETTLE OR HORSETAIL

2644 (((Alice turns and walks to Tommy and stands behind and above him with

2645 her arms extended left to right))

2646 (((Tommy extends arms out left to right))

2647 Alice: [(inaudible) Are you growing big and strong yet?

2648 Tommy: Yup.

2649 UY: (off camera) What are you doing?

2650 (Camera shifts away from Alice and Tommy to Marvin about 15 feet away,

2651 extending arms in two directions, meeting up with four other boys)

2652 Marvin: I'm uh I'm a salmonberry.

2653 Sal: (((Sal walks over to face Marvin))

2654 [Wait. What are you? What are you?

2655 Marvin: (..) I'm a (.) salmonberry that's (.) just looking for someone (.) to protect^.

2656 ((Sal leans into Marvin and pretends to bite his shoulder))

2657 ND: I'm nettle. [Nettle:. Nettle:!! Nettle:

2658 (((ND starts poking Sal with a stick))

2659 ((Marvin walks out of frame for 9 seconds))

2660 ((McG walks up to Marvin who has arms extended fully left to right))

2661 McG: What?

2662 Therese: That's a salmonberry, coyote.

2663 McG: (((McG leans forward to pretend to nibble on Marvin's hand))

2664 [I'm gonna eat your berries.

2665 ND: [Sting::. Sting, sting, sting:. You're getting stung.

2666 (((ND pokes McG with a stick))

2667 McG: I have fur.

2668 ND: Deers don't (inaudible)

2669 McG: I'm a coyote.

2670 Episode 4: Story of Coyote

2671 ((McG is talking to Trent. Trent is cupping his hands just above his head))

2672 Trent: What are you?

2673 McG: I'm a deer, what are you?

2674 Trent: ohh

2675 McG: What are you?

2676 Trent: ((in smiling voice)) I'm not anything.

2677 McG: Who are you?

2678 Trent: ((in laughing voice)) I'm not—you don't know!

2679 ((Trent turns away from McG))

2680 ((McG begins picking her fingers at Trent's hands and head))

2681 Trent: No! I'm not a horsetail! I'm not a horsetail

2682 McG: Mmm, you are so: good. You are so:: yummy.

2683 Trent: ohaahaahh

2684 ((McG turns away and approaches Miguel who is walking by her))

2685 McG: What are you?

2686 Miguel: I:'m:—oh go:d! ((Miguel turns around and runs away))

2687 McG: OWOOO!

2688 (McG walks up to Ninja and Dale who are standing next to each other)

2689 Ninja: (((points at Dale))

2690 [That's a bear and I'm a swordfern.

2691 Dale: (((Dale lifts hands up, curls fingers in claw icon))

2692 [Grrrr

2693 McG: [Whoa, see you later, see you later, see you later, see you later.

2694 (((McG runs away))

2695 Dale: ((Dale the Bear chases McG))

2696 ((gruffy voice) (#inaudible#))

2697 ((McG approaches Alice's cluster))

2698 McG: I'm a coyote. (.) so I'm gonna hide. (inaudible)

2699 UY: Alder tree is over there!

2700 McG: Are you an alder tree? [I'm digging a den in the alder tree.=

2701 (((McG bends down to Alice's feet))

2702 = [I'm hiding in the alder tree roots.

2703 (((McG holds onto Alice's calf))

2704 Alice: (inaudible)

2705 UY: I'm eating off of you

2706 Alice: (inaudible) but I'm falling down.

2707 McG: What's that?

2708 Priya: I'm a beaver and I just knocked her over.

2709 UY: And I am Winter.

2710 McG: I am a (.) (weak?) coyote.

2711 ND: [Sting sting sting sting

2712 (((pointing finger at McG))

2713 ((McG leaves that area and approaches David))

2714 Miguel: Fireweed

2715 McG: What are you David?

2716 David: (inaudible)

2717 Miguel: ((Miguel approaches McG))

2718 I'm fireweed.

2719 McG: What's that?

2720 Miguel: I'm fireweed.

2721 McG: You're a fireweed. How's it going, fireweed?

2722 Miguel: (inaudible)

2723 McG: Ni:ce! Fireweed, do you think [this salmonberry seed needs shelter?
2724 [((looks down at Marvin who is huddled on
2725 the ground in seed icon position))
2726 ((Alvin walks up to McG))
2727 Alvin: What are you McG?
2728 McG: I'm a coyo—#OOH YOU'RE A BEAVER! I'm pretty hungry, I'm gonna eat a
2729 beaver!#
2730 ((Alvin turns around and runs away,
2731 ((McG pursues him along with Amanda))
2732 Amanda: No wai:t, >wait, wait< I'm-I'm gonna eat him! What are you?=
2733 McG: =No we're gonna take turns!
2734 Amanda: Who are you?
2735 McG: I am a coyote.
2736 Kal: Do you want [meat?
2737 McG: [Are you an ewok?
2738 Kal: Do you want meat?
2739 McG: Yeah.
2740 Kal: Hunk of meat? Here you go.
2741 McG: #Argh!# Thank you! #Rarw! I feel goo:d#
2742 ((McG turns away toward Olive))
2743 What are you?
2744 Olive: *a squirrel*
2745 McG: #I'm a coyote, you know what I like to eat?#
2746 ((Olive runs away))
2747 UY: Ahh! What are you?
2748 ((McG wanders around))
2749 McG: Are there any berries? I'm Coyote I'll eat berries too.
2750 Dale: [Coyote! Rawr!

2751 **(((Dale races toward McG with hands reaching out in claw icon form)))**

2752 **McG: [Okay >I'm out of your way bear< I don't mess with you!**

2753 **(((McG runs away from Dale and toward Priya on the ground)))**

2754 **McG: [I'm sniffing around. I'm sniffing aroun.**

2755 **(((McG circles around Priya's body)))**

2756 **Priya: [I'm dead. [I'm (inaudible)**

2757 **(((Dale walks up to other side of Priya's body)))**

2758 **McG: [#Are you? Aw that's great, cause I could really use some#**

2759 **—oh you're swordfern I thought you were beaver.**

2760 **Priya: [I guess I am dead—I'm a dead beaver yeah.**

2761 **Dale: (((Dale leans and reaches hands toward McG)))**

2762 **[Hey: this is my kill**

2763 **McG: Dang it. Dang it. Dang it.**

2764 **(((McG walks away and toward Therese)))**

2765 **Oh I need a tree.**

2766 **Kathleen: (((walking past McG and Therese)))**

2767 **[I am bringing Winter:**

2768 **McG: [I need a tree:. What are you?**

2769 **Therese: [I can be a tree.**

2770 **McG: [Are you? Ah good. I need a den. It's winter and I'm hecka cold.**

2771 **(((McG crouches down on ground next to Therese's legs)))**

2772 **(5s lost recording)**

2773 **McG: ((speaking to Olive)) (inaudible) I'm hiding under my tree:s. [What are you?**

2774 **(((Olive runs up to Therese and McG)))**

2775 **Olive: (inaudible)**

2776 **Therese: (inaudible) my tree branches.**

2777 **McG: [That's right. Coyote's hunkered dow:n.**

2778 **Therese: [I think I see some fire walking around. Better be careful.**

2779 ((15 seconds pass as McG adjusts her POV camera; ND approaches
 2780 Therese and McG))
 2781 Norris: What are you?
 2782 Therese: I'm a tree.
 2783 McG: uh awesome tree, she's—
 2784 Therese: I'm a Grandma Cedar and I have a (crew:
 2785 McG: (inaudible) coyote and (inaudible)
 2786 Norris: sti::ng [sting
 2787 Therese: [(inaudible) for protection and a coyote [in a den.
 2788 Norris: [sting
 2789 McG: #denned up#
 2790 Norris: [sting sting sting sting
 2791 UY: [I'm a bald eagle and I'm gonna (inaudible)
 2792 Therese: Ooh, there's an eagle in my branches.
 2793 McG: Are you a ^Nettle^?
 2794 Dave: Yes.
 2795 McG: ^Nettles don't do much in the winter^
 2796 Therese: Nettle, I can protect you with sha:de.
 2797 Kaitlin: A coyote and eagle. There's an eagle's nest (.) in here.
 2798 Dave: Sting sting.
 2799 Therese: What are you Dave?
 2800 Dave: Uhm Swordfern
 2801 Therese: <Swordfern>! Oh you can have shade from my big Grandma Cedar Tree if
 2802 you'd like.
 2803 ((21 seconds pass without McG interacting))
 2804 Therese: What are you Kal?
 2805 Kal: I'm an ewok, what are you?
 2806 Therese: I'm a Grandma Cedar Tree. Ewoks like to hide in cedar trees?

2807 Kal: Yeah.

2808 Therese: Okay.

2809 Kal: An::d I need a tree house.

2810 McG: So you're up in the branches? (..) Cool.

2811 Therese: Looks like maybe-

2812 UY: Salmonberries.

2813 Therese: Ooh Salmonberries.

2814 ((Kal walks up to MCG))

2815 Kal: What are you?

2816 McG: I am a coyote, denning for the winter in the Cedar Tree roots.

2817 Kal: Do you want some meat?

2818 McG: Yeah. You got any meat?

2819 Kal: Here you go.

2820 McG: (gulp noise) Thank you.

2821 Kal: I brought you some water.

2822 McG: Awesome, aww, I am the happiest coyote on this planet.

2823 ((Kal walks away))

2824 Therese: Thank you Ewok

2825 Dale: (((Dale approaches Therese and McG and makes climbing gesture with

2826 arms)))

2827 [I am Bear climbing up this tree.

2828 Therese: There's a bear climbing in my [tree.

2829 McG: [Bearhide. #Sweet I'll be warm. I'll make

2830 my den and nest with it#

2831 Dale: I am going back down. ((Dale walks away)).

2832 Therese: Bye-bye bear: thanks for coming.

2833 McG: Ooh I'm a little hungry. I'm going to go hunting in this snow.

2834 ((McG leaves Therese and walks toward a group about six))

2835 Therese: **Do coyotes eat salmonberries?** (inaudible)

2836 ((McG walks up to Marvin who is standing with arms partially extended

2837 left to right))

2838 Marvin: (inaudible) **SALMONBERRIES:**

2839 McG: **What's that?**

2840 Therese: **I said, ["There's a salmonberry for you Coyote."**

2841 **(((McG turns to Therese who is pointing at Marvin)))**

2842 McG: **Mm, I'm gonna eat your berries.**

2843 **(((McG leans over Marvin's arm and pretends to eat))**

2844 **(((McG makes chewing noises))**

2845 Norris: **[Sti::ng, sting sting sti::ng you're getting stung.**

2846 McG: **[I-I have fur.**

2847 **(((McG turns to Norris who is holding a stick at her))**

2848 Norris: **Deers don't—I'm protected yeah protected.**

2849 McG: **I'm a coyote.**

2850 Norris: **Poke you in the eyeball.**

2851 ((McG walks away and up to Tommy who is squatting on the ground

2852 holding a stick))

2853 McG: **What are you?**

2854 Tommy: **[I have a gun now.**

2855 **(((Alice walks up to Tommy and stands over him and extends her arms**

2856 **left to right))**

2857 McG: **You do, huh?**

2858 Alice: **I'm protecting you.**

2859 Tommy: **I have a gun.**

2860 McG: **[I'm a coyote, I'm going to leave a little of my scent.**

2861 **(((McG circles around Alice))**

2862 **((Alice laughs))**

2863 Tommy: (inaudible)

2864 ((McG and Alice laugh))

2865 ((McG walks up to Brent and David))

2866 McG: And what are you guys?

2867 David: I'm a salmonberry,

2868 McG: Salmonberry!

2869 David: but there's no berries.

2870 McG: No berries?

2871 Brent: Yeah: he's already been stripped clean.

2872 (((Alan comes passing by, arms up in the air)))

2873 Alan: [SPRING:: WOO:::]

2874 McG: #<OH: MY GO:SH>, I AM SO:: HUNGRY:# It's spring and I'm hecka hungry

2875 (((McG walks toward Nathaniel))

2876 [what are you?

2877 Nathaniel: I'm fire.

2878 McG: [#Whoa, I'm out of here (.) I'm out of here (.) I'm out of here#

2879 (((McG turns and runs away)))

2880 UY: FIRE FIRE!

2881 ((McG runs up to a group of four))

2882 McG: Watch out guys, FIRE'S coming around! Guys, FIRE! Run away! FIRE'S

2883 coming around (.) be weary.

2884 ((The group disperses))

2885 Alan: [SPRING:: SPRING:: SPRING::

2886 (((Alan dances in circles with hands high up in the air)))

2887 ((McG walks toward a group of three including Regan who is holding a

2888 spray bottle))

2889 Regan: Rai::n!

2890 McG: Oh good, come here I'm thirsty. [(.) Oh things smell good, thank you rain.

2891 **(((Regan sprays McG)))**

2892 **((McG turns and walks up to Sal who is running))**

2893 **(.) And what are you? (..)**

2894 **Sal: Raven**

2895 **McG: A ra::ven!**

2896 **Therese: So that there can be more:: (.) Cedar Trees growing around me.**

2897 **((Lee comes walking past McG))**

2898 **McG: What are you?**

2899 **Lee: I'm a little spore.**

2900 **((McG continues walking toward Priya))**

2901 **UY: What are you?**

2902 **McG: oh, I'm a coyote (..) that's having a rough winter. (.) I'm not sure I made it**

2903 **through the winter. (.) [I got sick and I died.**

2904 **(((McG sits down on the ground)))**

2905 **Dale: (inaudible) There's a fire!**

2906 **McG: #Fire got me#**

2907 **Priya: I'm a beaver.**

2908 **((Priya comes walking by))**

2909 **McG: I'm dea:d. I'm a dead coyote, well fire got me.**

2910 **Priya: Oh fire? (..) Not me (..) I hid underneath water.**

Appendix D: Pilot Episode Transcription

7.19.16 Tuesday LARP hike to DBS bigleaf maples-b

The group is walking. Joe is walking backwards filming. There are two simultaneous conversations happening in the group. At the front Joe and Rihanna talk, and Mary quickly joins them. Back further out of audible range for about 30 seconds are Regan, Isabell, and Jake.

2911 Gabe: Big leaf maple. (...) Okay, so you're gonna teach them about big leaf maple,
 2912 and then we're going to role-play big leaf maple on the way back. Do you
 2913 remember everything about the role playing stuff, but you're only big leaf maple.
 2914 That's it.
 2915
 2916 Regan: Okay, so wait. What are we suppose—so when we get back we're supposed to
 2917 do like—
 2918 Erika: I'm a #salmonberry#
 2919 Regan: Oh: so we just tell what we are and why and like how it goes? Like
 2920 [#]: grow like this# or
 2921 [((Regan raises both arms upward, elbows bent ninety degrees))
 2922 whatever I dunno?
 2923 Rose: You're supposed to be thinking about what it would be like to be that.
 2924 Regan: Oh, okay. So like (...) #I am sad because I cannot wa:lk
 2925 [but I can grow# (.) Something like that^ I dunno
 2926 [((Regan raises both arms upward, elbows bent ninety degrees))
 2927 Rose: Mm-hmm (affirmative)
 2928 ((Regan walks up to Mary who is leaning over side of trail into flora and picking
 2929 a blackberry))
 2930 Regan: Don't try too hard Mary
 2931 Unknown: Tsch (..) tsch
 2932 Regan: You hear that?
 2933 Jake: Don't try too hard Mary

- 2934 Regan: You'll (inaudible) though. Ok (.) ooh there's a really nice one over there. (...)
- 2935 (inaudible) [Is that a big leaf (.) maple (.) Mary?
- 2936 [((Regan points at a tree in the forest bordering the path))
- 2937 Mary: yeah
- 2938 Regan: I have to ask the questions
- 2939 Rose: Where's Rihanna? RIHANA:
- 2940 Regan: Oh wait we— (...) We're waiting for Rihanna. ((looking at Jess)) What are you
- 2941 learning about?
- 2942 Mary: [Nothing:: Yay:::
- 2943 [((Mary raises left hand high in the air and then shakes both hands, palms out,
- 2944 shoulder length))
- 2945 Jess: Nothing at this moment [(inaudible)
- 2946 Regan: [(inaudible)—did you learn any-thing from me?
- 2947 Mary: Yeah::
- 2948 Regan: What did you learn?
- 2949 Jake: We learned >how tiring it is< to walk up those stairs.
- 2950 Regan: [Actually it wasn't that tiring (.) just run up it
- 2951 Mary: [We learned that (.) swordfern helps (.) stinging nettles.
- 2952 Jake: The other people in our group were like (pants) and then me and this one dude
- 2953 were like (..) just standing there. [I was breathing through my nose
- 2954 Jess: [I was way: in front of my group
- 2955 Jake: I was just like ((demonstrates nose-breathing))
- 2956 Regan: Yeah I didn't (..) probably because we stopped (.) so much.
- 2957 Jake: We didn't stop. We were just like (.) walk (.) walk (.) walk
- 2958 Rihanna: ((to Joe)) I've been walking for MILES and miles
- 2959 Regan: Miles (.) MILes (.)
- 2960 Jake: Miles? More like not even a mile.
- 2961 Regan: Hey [vine maples (..) our cousin

- 2962 [(Regan points to a tree in the forest to the right of the path))
- 2963 ((turns head and looks at Isabell)) Are you learning about (.) big leaf maple?
- 2964 Isabell: No
- 2965 Regan: Salmonberry?
- 2966 Isabell: [no
- 2967 Regan: [chickenberry?
- 2968 Isabell: #>Chickenberry<#!
- 2969 Jake: #You [named chickens after berries#
- 2970 [(Regan points to a tree in the forest next to the path))
- 2971 Isabell: shiggiinberry (.) [shiggin
- 2972 Regan: [and this is big leaf maple
- 2973 Isabell: [Shiggin
- 2974 Jake: [(inaudible)
- 2975 Regan: ((Regan walks up to big leaf maple leaves extending over the path and touches
- 2976 one))
- 2977 The leave are hu::ge
- 2978 Isabell: Can we eat those leaves?
- 2979 Regan: And these are—yes (.) yes you can (...) actually I don't know. Just eat it
- 2980 (laughs)
- 2981 Isabell: even when you don't want to go to school
- 2982 Regan: ((laughs) yeah

At this point, the two sub-groups coalesce. The following transcript, however, runs parallel to the previous transcript.

- 2983 Rihana: I've been walking for MILES and miles (..) [^hm-hm^
- 2984 [(jumps up while raising right
- 2985 hand))
- 2986 (4s) What are you even doing?
- 2987 Joe: I-I'm filming.

2988 Rihana: Recording? ((takes a drink from water bottle))

2989 Joe: (8s) I-I'm >filming you become a maple<. Can you can you perform? Can you

2990 show us how what a maple would would do if if you were a maple? (.) #What

2991 would a maple do if it were you?#

2992 Maria: #I would grow into a tall tree.#

2993 Rihana: #I would grow the tallest.#

2994 Maria: [I: would be the strongest of all the trees

2995 [((arms fully outstretched in a wide V))

2996 Jake: (inaudible) ((quasi-imitates Maria's gesture with half raised arms))

2997 [probably Regan

2998 [((looks back and to the left at Regan))

2999 Regan: What?

3000 Maria: ((looking at and pointing to Jake)) You'd be the guy in the background.

3001 Jess: Ha

3002 (4s)

3003 Regan: [((points to big leaf maple to the right of path))

3004 [Big leaf maple:

3005 Joe: Are all of you maples?

3006 Maria: [Maple: ((sing-songy))

3007 [((jumps up and raises left arm high))

3008 Regan: [Maple: ((sing-songy))

3009 [((half raises right arm))

3010 Rihana: [((raises both hands above head holding water bottle between them for

3011 24 seconds))

3012 Isabell: [Maple: ((sing-songy))

3013 [((quarter raises right arm))

3014 Rihana: [Maple: ((sing-songy))

3015 Isabell: [Maples over there

3016 [((Isabell looks back, to the right, where Regan had been pointing out maples
3017 earlier, and points in that direction))
3018 Regan: ((to Isabell)) We're another maple.
3019 Isabell: uh-huh
3020 Jess: We're we're maple babies.
3021 Rihana: I'm a maple (.) See? I'm a maple. ((still holding water bottle above head))
3022 Joe: #What do you do^ maple tree:?# ((quasi-sing-songy))
3023 Regan: We grow=
3024 Rihana: =I grow=
3025 Jake: =And we grow even more (.) <and then we fall over>
3026 Regan: [We grow (.) and we (.) move our branches (.)=
3027 Rihana: [and then I s—and I stop. (inaudible)
3028 Jake: =and then we die=
3029 Regan: =[no
3030 [((turning head to face Jake))
3031 Rihana: [and I just—((shakes head))
3032 Joe: What do you grow into? Where is this growing happening?
3033 Regan: [((raises both arms up and outward into a full V))
3034 [Well we grow up and out so that we get more [sunshine
3035 Jake: [water
3036 Regan: like a: like a tree does
3037 Joe: You grow up and out into the ocean?
3038 Jake: [Yes:
3039 Regan: [No [up and out into the sky
3040 Regan: [((raises right arm upward))
3041 Joe: What does the sky have that you want?
3042 Regan: Sun=
3043 Jake: =sun (.) and water

3044 Joe: Why do you want the sun? Why do you want the water?

3045 Jake: Water so we can (inaudible) so we [don't dry out

3046 [(Rihana drinks from water bottle)]

3047 ((15 second hike logistics talk))

3048 Rose: So what do you guys think it would be like [to be a bigleaf maple?

3049 Rihana: [We need water (.) and rain=

3050 [(Rihana holds water bottle up)]

3051 ((Regan's response to Rose's question breaks her away from the larger group

3052 and runs parallel for 11 lines until Regan rejoins the larger group))

3053 Regan: ((to Rose)) um (..) it'd be (.) har:d (.) hard in the summer because it would be

3054 hot. And we nee:d a perfect amount and then we'll lose our (.) branches. I

3055 dunno (.) it might hurt. Um (...)

3056 Maria: ((eats a potato chip from a bag she's holding)) Potato chips

3057 Jake: Potato chips?

3058 Maria Potato bu:gs

3059 Jake: Potato bugs?

3060 Rihana: No we nee:d (.) more maple trees, righ:t? (..)

3061 Joe: You need them or you are them?

3062 Jake: (.) We are: them

3063 Rihana: WE MADE 'EM

3064 Joe: Oh you made them

3065 Rihana: We need more

3066 Joe: You made yourselves^

3067 Regan: We made what?

3068 Joe: You made yourselves into maples.

3069 Regan: [Yep

3070 [(gives thumbs up with right hand)]

3071 Jake: With the power of trees

3072 Maria: [WITH THE POWER OF OXYGEN
3073 [((raises both arms in a wide V)
3074 Joe: What's the power of trees?
3075 Maria: You [know [(.) nutrients
3076 Rihanna: [((raises right hand in air))
3077 Jess: [Oxygen:!
3078 Regan: Oxygen
3079 Rihanna: THE POWER OF [OXYGEN
3080 [((jumps in air with right arm raised))
3081 Jake: [Oxygen and nutrients (..) soil
3082 Rihanna: (..) But we need a lots (.) more trees (..)
3083 Joe: As a tree you need more trees (.) Why do you need more trees?
3084 Group: hmm-um=
3085 Jake: =TO SHARE THE NU[TRIENTS
3086 Maria: [so you're not lonely

Appendix E: Analysis and Findings of Pilot Episode

Research Questions. How does the interactive harnessing of play-and-reflection help mediate learning the pedagogical goals of I-STEAM? How do interactants harness reflective discourses as an interactive resource for epistemic action? How do interactants harness play as interactive resource for epistemic action?

In launching the activity, Gabe addresses Regan, the most senior member of the youths in the group, positioning her to teach the other group members about big leaf maple for the first half of the hike, followed by role-playing big leaf maples in the second half. This launch precedes the focal episode by about 20 minutes, after the first exercise has been completed and the students are tasked with role-playing big leaf maples.

Gabe: Big leaf maple. (...) Okay, so you're gonna teach them about big leaf maple, and then we're going to role play big leaf maple on the way back. Do you remember everything about the role playing stuff, but you're only big leaf maple. That's it.

As this activity begins, Rihana, the youngest member of the group, quickens her pace toward Joe, announces that she's been walking "miles and miles," and asks what he is doing. Joe is holding a camera, walking backwards, and appears to be filming Rihana's group (and has been for the entire hike). At the same time, Regan, wearing a POV cam, lags slightly behind engaging fellow bigleaf maples as well as a group of vine maples. Regan points out bigleaf maples as they walk and engages in dialogue with both the lag group of predominantly vine maples and the lead group of Rihana and Joe. Joe positions himself in relation to Rihana and her group ("I'm filming you..."), indexing both in-frame as a maple-character ("you become a maple") and out-of-frame as a student-actor ("Can you perform?") layers with which she and the group have been tasked.

- 3097 Rihana: I would grow the tallest.
- 3098 Maria: [I: would be the strongest of all the trees
- 3099 [((arms fully outstretched in a wide V))
- 3100 Jansen: (inaudible) ((quasi-imitates Maria's gesture with half raised arms))
- 3101 [probably Regan
- 3102 [((looks back and to the left at Regan))
- 3103 Regan: What?
- 3104 Maria: ((looking at and pointing to Jansen)) You'd be the guy in the background.
- 3105 Jess: Ha

Jansen and Regan, who are siblings and whose mother is a camp educator, appear to straddle the rims of both groups, simultaneously participating in conversations from both groups. Jansen's challenge to Maria's claim draws a parallel between in-frame and out-of-frame participation structures. When Maria claims that she would be the strongest of the trees, Jansen's response that Regan would be suggests an isomorphic parallelism between the out-of-frame and in-frame playworlds, because Regan is the oldest and tallest of the youth. Maria's response does not challenge Jansen's claim, but does modally position him in-frame as backgrounded in relation to other maples. This response may serve three functions: playing forward the hierarchical relations between trees in a response to her read of Jansen's turn as re-positioning her; an implicit ratification of Jansen's proposal by not contesting it; a proposed hypothetical positioning of Jansen as a "guy" and, thus potentially not a tree, in the "background," and thus not as salient as other tree-players. Regan's response signals both a bid for interactive repair of what was not heard (by her), as well as a move that draws together the group interacting with Joe and the group interacting with Regan. Thus, through the joint action of Jansen and Regan, both groups begin to coalesce. Regan's subsequent move to point out a bigleaf maple has the potential

effect or reorienting the group toward the dual task at hand, to learn about bigleaf maples by enacting them.

Joe's next turn repositions the verb construction and numeracy of the characters. He opts to shift from a modal verb to a present tense existential verb, which re-frames the activity as in-frame, and repositions the participants as actors negotiating in-frame status to in-frame trees. His move also potentially contests Maria's positioning of Jansen by offering Jansen, as part of the plural group, to position himself in relation to existential status as a maple. All participants, including Jansen, ratify Joe's re-framing question, meaning that adopt in-frame statuses, specifically as maple trees. Their embodied response (raising arms in Vs, plausibly to iconically signal their branches) as well their sing-songy tones further indicate multi-modal and whole body ratification of in-frame, playful enactment of maple trees. In short, the phatic connection with Joe and each other is given a playful key, which simultaneously signals intent to align with the LARP assignment. Furthermore, the first suggestion of a collective identity emerges, which will be taken up further in the next sequence (or, micro-cycle? see Findings below). This sequence comes to an end as Rihana ratifies and elaborates on Joe's framing question. Her ratification is multi-modal, collectively ratifying her in-frame participation, with numerous effects. It adopts the existential in-frame stance, plays forward the individual first-person stance, and draws explicit attention to how she is embodying the role to maintain in-frame status.

3106 Regan: [((points to big leaf maple to the right of path))

3107 [Big leaf maple

3108 Joe: Are all of you maples?

3109 Maria: [Maple: (sing-songy)

3110 [((jumps up and raises left arm high))

3111 Regan: [Maple: ((sing-songy)

activity is linked affectively (through sing-songy tone) to the extra-situational recent history of the camp that has involved each of the participants.

Furthermore, Jess is the first participant to propose (implicitly) re-positioning each character's identity as a collective identity, suggesting that the identity (or member category; Stokoe, 2012) of maple may be collective. Furthermore, she proposes a sub-group of "maple babies," potentially reusing the earlier discussion about relative sizes, as well as Jansen's proposal that Regan was the strongest and tallest maple, to position (Stokoe, 2012) internal relations among the maples. In short, proposals of a collective identity and internal relations are now in the air of the interaction. In his next turn, Joe revises his earlier reflective question from a modal construction to an implied agentive capacity embodied by the maple characters, foregrounding the maples' capacity to act. His question appears to leave open the respondent interpretation whether maple identity is singular or collective.

- 3123 **Joe:** **What do you do^ maple tree:? ((quasi-sing-songy))**
- 3124 **Regan:** We grow=
- 3125 **Rihana:** [I grow
- 3126 **Jansen:** [And we grow even more (.) and then we fall over
- 3127 **Regan:** [We grow and we move our branches (.) [and=
- 3128 **Rihana:** =[and then I s—and I stop. ((inaudible)) [And I then I just—((shakes head))
- 3129 **Jansen:** [and then we die
- 3130 **Regan:** no ((inaudible))

The tones of Joe's question emphasize the second "do" and "maple tree," ostensibly marking the linking of a tree capacity to act, or agency, and creating a space for interactive reflecting on category-bound activities (Stokoe, 2012) of maple trees. Furthermore, addressing the question to "you...maple tree" clarifies the in-play-frame positioning of the characters, who are no longer just participants, but creators invited to animate the understanding of maple tree

history as taught to them in I-STEAM (as well as via other funds of knowledge they may have). Regan's reply adopts the we positioning. It is unclear if Regan hear the earlier utterance framing a collective identity, though even then that framing appeared to be framing smaller trees (viz., smaller players) in relation to bigger trees, such as Regan. Thus Regan interprets Joe's ostensive cue as a prompt to foreground a collective identity. Furthermore, Regan ratifies the agentic intent of Joe's question and links the collective identity to growth. This position is echoed across multiple participants. Rihana continues to adopt an individual account, though also aligns with the agentic growth of the tree. Jansen adopts the collective identity, and layers on continued growth, implicating a temporal dimension to tree growth and agency, and then takes this temporal dimension to its agentic extent by indexing tree collapse and death. Joe's next reflective question takes up the consensus response that the maples grow and adds the layer of place, which asks the maples to identify what kinds of places or landscapes where they grow. This question serves multiple functions. By pivoting on the language of participant responses, it signals to them that their contributions are heard and worthy of further reflection, it opens up further reflection on maple tree agency, it retains the sense that the "you" in the questions is ambiguous and can be construed collectively, and it links the agentic growth of maples to one of the axiological concerns of I-STEAM, the land-based emplacement of plant relatives.

3131 **Joe:** **What do you grow into? Where is this growing happening?**

3132 Regan: [((raises both arms up and outward into a full V))

3133 [Well we grow up and out so that we get more [sunshine

3134 Jansen: [water

3135 Regan: like a: like a tree does

3136 **Joe:** **You grow up and out into the ocean?**

3137 Jansen: [Yes:

3138 Regan: [No [up and out into the sky

3139 Regan: (((raises right arm upward))

Regan responds multi-modally, using her body to indicate how her branches grow “up and out.” Her embodied movement implies up into the sky, which she affirms by linking tree growth as directed at sunshine, though she does not immediately specify the place. Furthermore, she now links the we-identity of trees to a we-intentionality (Rakoczy, 2008; Riihelä, 2002). Jansen adds that the tree also grows toward water. Hearing a potential discrepancy, Joe reuses Regan’s substrate (Goodwin, 2018) “grow up and out” to clarify whether Jansen’s response “water” indicated that maples grow into the ocean. Joe’s question serves multiple phatic functions, tying Regan and Jansen together his response calls for consistency in the group’s responses, coalescing the collectivity of the trees, and upkeying the sense of play (Goffman, 1974; Licoppe & Morel, 2012). since it’s somewhat absurd to imagine that Regan meant the ocean. Jansen picks up on Joe’s upkeying move and says “yes:”, continuing to upkey the playful affect. Regan takes a more literal tack, and clarifies that she means the sky, again linking this referent to her arm-branches through embodied gesture. In a certain sense, Regan is not only teaching Joe about her (maple) growth, but she is also teaching him that trees communicate through their bodies, an isomorphic capacity shared between humans and maples that she (and others) has been harnessing for role-play.

Joe’s next reflective question again serves multiple functions. Again, the question reuses and pivots on participant language, ostensibly marking “sky,” while adding an additional layer, suggesting a link between maple tree agency (growth) and place (sky) driven by maple desire (“want”). Regan and Jansen co-construct a pedagogical response to Joe’s question, linking maple tree to sun and water, which are located in the sky. Joe pivots again on terms introduced by the participants, asking reflective questions that both re-use participant language and ostensibly mark it (“sun” and “water”), inviting further elaboration; furthermore, Joe’s question invites

them to reflect on the motivation (“why”). Jansen responds to Joe’s reflective prompt by offering new information about his (maple) motivation for seeking water, linking tree bodily health to agentive motivation toward kinds in shared space. As he shares this, Rihana takes a drink of water from her bottle, iconically aligning in-frame maple-character with out-of-frame human-player need for water.

- 3140 **Joe:** **What does the sky have that you want?**
- 3141 Regan: Sun=
- 3142 Jansen: =sun (.) and water
- 3143 **Joe:** **Why do you want the sun? Why do you want the water?**
- 3144 Jansen: Water so we can (inaudible) so we [don't dry out
- 3145 Rihana: [((drinks from water bottle))
- 3146 ((13 second hike logistics talk))
- 3147 Rose: So what do you guys think it would be like to be a bigleaf maple?
- 3148 Regan: ((to Rose)) ((inaudible))
- 3149 ((Rose and Regan have an inaudible conversation))
- 3150 Rihana: [We need water (.) and rain=
- 3151 [((raises arms above head again, joining hands to hold water bottle above
- 3152 head))
- 3153 Maria: ((eats a potato chip from a bag she's holding)) Potato chips
- 3154 Jansen: Potato chips?
- 3155 Maria: Potato bu:gs
- 3156 Jansen: Potato bugs?

Rihana, who has been verbally silent for several turns, now speaks again. Her short turn evidences several contributions. First, she adopts the we-identity, which is the first time she does so, aligning her with the we-identity of all other participants, and solidifying the collective identity of the maple trees. Second, she links the we-identity to we-intentionality and collective

desire with the construction “we need.” Third, she transforms the discussion of “wants” to a discussion of “needs,” suggesting a relation between maple, place, and kinds that is more pressing than mere desire. Fourth, she echoes the interactional substrate of “water,” which along with the we-alignment, links her utterance to prior utterances and inserts herself into the ongoing joint action. Finally, she adds a layer that had not yet been articulated, linking maples to rain, clarifying what in the sky brings water. In this move, she elaborates on and clarifies a distinction between ocean and sky, which both have water, affirming that the linking of maple to sky and water is merited via the rain, clarifying why the ocean is not a plausible environment for maple growth.

The sequence closes with Maria upkeying the playful tone of the interaction, sarcastically (Licoppe & Morel, 2012) adding that trees need potato chips, which she is eating. While playful, her remark also re-affirms the in-frame status of the role-playing, which may be in response to Rose’s and Regan’s parallel conversation. That conversation, which is not audible for the most part, was framed by Rose’s question that returns to an out-of-frame hypothetical state, indexed by the modal “would,” and positions the group as “guys,” which also potentially addresses the players rather than the characters. Given the in-frame players tend to engage a range of meta-communicative practices to sustain in-frame pretense once in motion (Giffin, 1990), Maria’s response may be a move that acknowledges out-of-frame status and actions (e.g., Maria eating chips) while pivoting (Vygotsky, 1966/2016) on the chips to reframe the interaction in role-play by suggesting trees need chips. Jansen, who is further away from Rose and Regan, and may not have heard their interaction, expresses confusion in response to Maria, who retains the playful key by evolving potato chip to potato bug, again displaying gradual symbolic transformation of the pivot by utilizing meta-communicative “ulterior conversation” (Giffin, 1990) to link out-of-

frame negotiation to in-frame pretense, while remaining in-frame, by transforming “chip” to “bug,” a more plausible participant in maple tree ecosystems.

In the next sequence, Rihana appears to adopt a realist stance in response to the potato chip/bug exchange by replacing potato bugs altogether with other maple trees. Her turn construction appears to negate the unrealistic proposition of maples needing potato bugs and clarifying that maples need maples. Her turn-ending intonation of “right?” appears to signal not uncertainty about her claim but a bid for Joe to ratify her response as a fact of the in-frame story they are telling (Giffin, 1990). Unclear about her question, Joe asks a reparative question (Schegloff, 1992), offering Rihana options to clarify her question. The sequence that follows clarifies her response, affirming the in-frame existential status of players-as-maples as well as the imperative dependency of maples upon maples.

- 3157 Rihana: No we need (.) more maple trees, right? (.)
- 3158 **Joe:** **You need them or you are them?**
- 3159 Jansen: We are: them
- 3160 Rihana: WE MADE 'EM
- 3161 Joe: Oh you made them
- 3162 Rihana: We need more
- 3163 Joe: You made yourselves^
- 3164 Regan: We made what?
- 3165 Joe: You made yourselves into maples.
- 3166 Regan: [Yep
- 3167 [(gives thumbs up with right hand)]

Jansen responds to Joe by affirming that they are maple trees, which reinforces the collective in-frame stance of Jansen and the group. Rihana responds by clarifying that they made themselves, that maples make maples. Across this sequence of action, Rihana appears to be

working out a logic that because maples need more maples they must make more maples. Again, Rihana's contribution pedagogically adds a layer that other characters had not considered, as evidenced by Jansen not correctly projecting the intent of Rihana's contribution. Furthermore, Rihana ostensibly marks her own clarification with an exclamatory volume, indicating to the group the novelty of her contribution to the ongoing dialogue. Joe revoices Rihana's mark, signaling contingent responsivity to how she has added a new informative layer to the conversation that also re-orientes the kind of plant relatives with whom Joe is interacting, in effect re-orienting the phatic frame of interaction; thus, Joe appears to inflect "yourselves^" signaling a transformation in his sense of who "yourself" is in this interaction. Perhaps noticing these marked utterances, Regan shifts attention from responding to Rose to re-entering the conversation with the other characters. Her shift immediately meta-communicates a toggling from out-of-frame modal stance with Rose to an in-frame enactment stance (Giffin, 1990) with the group. When Joe repeats for her, she proffers a multi-modal response, further signaling her return to the in-frame participation framework.

Jansen then joins in by layering on more new information for this interaction, making explicit that trees make themselves with their internal power. In a certain sense, Jansen's utterance anticipates the projectible adjacent pair sequence (Schegloff, 2007) Joe has been practicing with the group, as Joe may have asked "how do you make yourselves?"

- 3168 Jansen: With the power of trees
 3169 Maria: [WITH THE POWER OF OXYGEN
 3170 [((raises both arms in a wide V)
 3171 **Joe:** **What's the power of trees?**
 3172 Jansen: You [know (.) nutrients
 3173 Rihana: [((raises right hand in air))

- 3174 Rihana: THE POWER OF [OXYGEN
 3175 [(jumps in air with right arm raised))
 3176 Jansen: [Oxygen and nutrients (..) soil
 3177 Rihana: But we need a lots (.) more trees (..)
 3178 **Joe:** As a tree you need more trees (.) **Why do you need more trees?**
 3179 Group: hmm-um=
 3180 Jansen: =TO SHARE THE NU[TRIENTS
 3181 Maria: [so you're not lonely

Maria then reuses Jansen's utterance while layering on greater specificity about the power of trees, specifically oxygen. However, the conjecture that maple trees make themselves with oxygen may sound odd (to wit, trees produce oxygen but themselves draw in carbon dioxide for their synthesis of power, among other relations). Joe's question reorients the group to reflect further on Jansen's gambit, potentially to expand what the power of trees may be. After Jansen links the power of trees to nutrients, and Rihana emphatically revoices verbatim Maria's contribution, Jansen expands the power sources of trees to oxygen, nutrients, and soil.

Rihana then returns to the necessary link between maples and more maples, emphasizing (with apparent ostensive marking) that they need "lots" more trees. She does not specify whether these trees are maples, but it is clear that the relation is one of necessity and number. Joe then pivots again on the substrate "more trees," ostensibly inflecting "more," asking for their motivation. Connecting to a source-kind already developed in the emerging substrate, nutrients, Jansen emphatically (ostensively, and pedagogically) adds the layer that trees needs more trees to share nutrients. Thus trees are now linked through a category-tied predicate (Stokoe, 2012) of sharing, or possibly caring, an added axiological dimension that calls forth the Indigenous stories and theories (Marin & Bang, 2018) of the I-STEAM camp. Finally, Maria posits so that the trees are not lonely, which further indexes the storying of the eco-systemic relations taught at the

camp (Grandmother Cedar story), but also proposes that loneliness is not avoided. Furthermore, Maria's response simultaneously shifts pronouns to a second person frame, opening up a new participation framework and stance toward the first-person collective identity that had driven most of the interaction to that point. While this interaction carries on from here, taking up a second-person participation framework and the theme of tree loneliness, space does not permit further analysis. However, I present this frame-shifting turn to mark how the interactants themselves signaled to each other, and thus to me as analyst, that the interaction shifted at this point from the focal discussion of this paper.

Findings and Discussion: Using RD to Epistemically Map an Ecosystem from the Perspective of the Maple Tree

My ultimate finding was that the group developed two emergent theories about trees through the epistemic actions of play-and-RD:

- A theory of tree assembling or configuration: A networked webbing of relations assembling an ecosystem with agents and kinds from the perspective of maple trees
- A theory of tree agency: Transformation of relational motivations from individual desires (“wants”) to interdependence (“needs”) that opened to an emerging theory of collective tree autopoiesis

The following discussion of findings deconstructs how these theories were interactively developed.

Finding 1: Reflective Discourse is Co-operative and Joint Action

In these sequences, question-formats were the dominant form of turn-construction ostensive marking used by Joe (bold-font lines in the transcript). Reflective questions were constructed by “decomposition and reuse” (Goodwin, 2018), or dialogic revoicing (DuBois,

2014), of youth utterances, or substrates (Goodwin, 2018). Iterating on these substrates, questions often layered on language linked to axiology of I-STEAM 2016 (de los Angeles, 2016). For example,

Joe: What do you do maple tree?

Rihana: I grow and then I stop. (...)

Joe: Where is this growing happening?

This structure signaled to the youth that their voices were heard and integrated into ongoing collective activity (Forman & Ansell, 2002), with questions oriented toward either elaborating on their prior utterances or exploring implications of their utterances.

In total, Joe appears to ostensibly mark nine reflective shifts that were taken up in the interaction. Interaction analysis shows that each shift was contingent on prior phatic connections (Žegarac and Clark, 1999), joint attention to the discursive and embodied content of the interaction, and substrates (Goodwin, 2018) of prior utterances by the student-participants. While traditional pedagogical models frame both ostensive marking and pedagogical communication as produced by the caregiver/teacher (Csibra & Gergely, 2009), the sequences here exhibit greater social distribution of reflective and informative action, in which Joe's ostensive moves afforded student pedagogical responses that informed each other and Joe (cf. Goodwin, 2018, chapters on Chil).

Furthermore, participants typically ratified, reused, and layered onto each other's responses with little tension or contradiction, challenging the premise that activity systems operate by logics of tension or contradiction (Engeström & Sannino (2010). Indeed, in the cases of contested grounds, disagreements were either ignored or playfully evolved. Participants never stepped out-of-frame to negotiate in-frame roles, actions, and predicates. In other words, the

role-play structure of the activity appeared to provide a motivation to remain in-frame as much as possible (Giffin, 1990), providing a phatic ground that affording a collaborative discourse that a continually expanded the knowledge category of “maple tree” without a lot of discursive challenging that may otherwise characterize scientific argumentation (e.g., Nussbaum, 2008). This also likely reflected Indigenous practices of the camp that stressed relations, respect, and reciprocity; as well as the cultural-historical practices each participant brought forward from their respective Indigenous communities. In short, the play-structure of the interaction and the cultural-historical Indigenous ethos conjointly provided a ground for collaborative scientific discourse that layered reflective discursive moves onto in-frame pretense preferences (Schegloff, 2007), distributing responsibility for reflective action among all participants, while remaining in-frame and on task with the play-assignment (see also Giffin, 1990).

While the analysis here focuses on Joe’s reflective moves and ostensive marking, the students themselves displayed numerous ostensive moves. Space here does not allow further consideration of student ostensive moves, though I am analyzing these elsewhere. Indeed this may turn out to be my most significant finding, though it only bolsters the finding that the micro-practices of RD were socially distributed among all participants.

Finding 2: Chaining Cycles of RD Expands Learning

Through decomposition, re-use, transformation, and addition, micro-cycles of RD were interactively layered reciprocally, progressively, and expansively (Salmon, 2016) to form chains of macro-cycles of RD (Figure 8). Macro-cycles were characterized by stable in-frame participation structures that reflected particular axiological stances toward the frame and afforded continuous expansion of knowledge about maple tree capacities and relations. Due to its complexity, I break this finding down into two parts: micro- and macro- cycles.

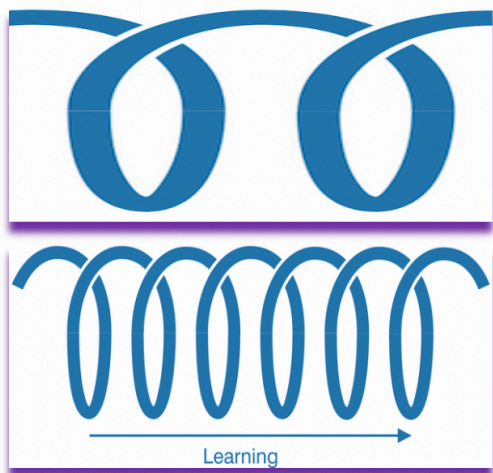


Figure 8. RD is chained into micro- and macro-cycles

Chaining is illustrated in Figure 9, in which the same utterance is pedagogical in relation to a foregoing ostensive shift and phatic in relation to a forthcoming ostensive shift. When Rihana says “I’m a maple,” Joe responds ostensively by intensively inflecting his question that positions Rihana to respond pedagogically. Thus her reply, “I grow...” initially is pedagogical in relation to Joe’s prior-turn ostensive question. When Joe responds with another ostensively marked question, “What do you grow into?” he now renders Rihana’s prior utterance (which had previously been pedagogical) as the phatic grounds for a new pedagogical response. Rihana’s same utterance, “I grow,” can be either phatic or pedagogic depending on where it stands in adjacent relation to ostensive questions. In short, RD can be chained in micro-cycles of continuous phatic-ostension-pedagogic/phatic-ostension-etc.

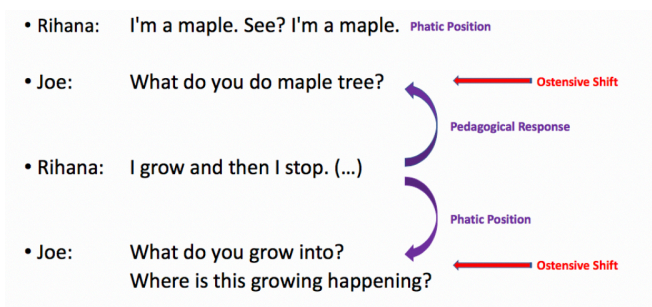


Figure 9. Chaining pedagogical and phatic

Finding 2b: Chained Macro-cycle of RD

Figure 10 summarizes five reflective moves made by Joe that chain together several micro-cycles of RD to form a macro-cycle. Each reflective move invites co-construction of pedagogical information by all participants. Collectively, the moves build on prior moves and responses, chaining together ostensive signals that mark a pedagogical tone to the interaction, playful engagements that phatically sustain the continuity of the interaction necessary to chaining, while continually linking maple-character utterances to learning goals of the activity aligned with goals of I-STEAM. Collectively, chaining together the five micro-cycles indexed by the reflective moves in Figure 10 helps link players to maple agency, maple agency to place, maple volition to natural kinds inhabiting the same environment, maple volition to natural kinds that power maples, and maples to each other as necessary to interdependent, collective self-creation (autopoiesis). The macro-cycle is created by micro-cycles of RD and held together by phatic framing that places players in-frame in particular participation and axiological orientations to each other and world they are figuring together.

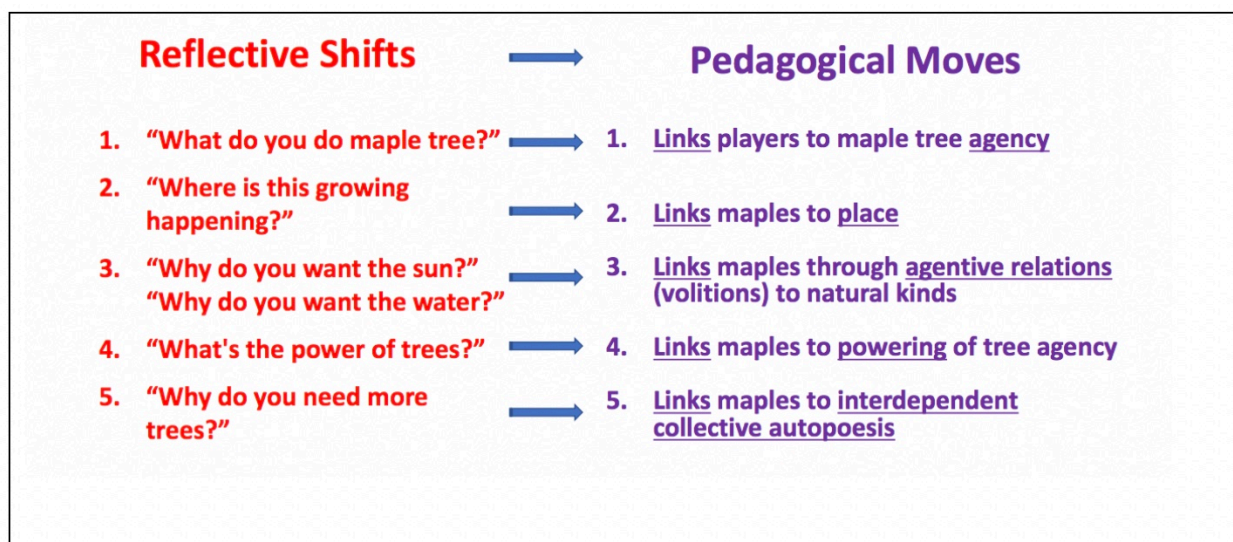


Figure 10. Chaining moves

Finding 3a: Language Devices as an Interactive Resource for Frame Transformation

Interactants use grammatical structures of language as interactive resources (Goodwin, 2018). In this episode, interactant use of pronouns and verbs signaled participation frameworks and interactive frames, axiological stances within and toward those frames, as well as expansion of knowledge about maple tree perspective on its ecosystemic relations. Initially, the youth were positioned to be teacher (Regan) and learners (other youth in the group) for the first half of the hike and then engage in role-play in the second half of the hike. However, as research on play has indicated, youth in fact moved in and out of pretense frames (Giffin, 1990) during the second half, which was in part signaled by pronoun and modal verb shifts.

Participant pronoun use appears to be a potential marker, or interactive signaling cue, of macro-cycles comprised of multiple micro-cycles. The same pronoun choices endured across the micro-cycles of a given macro-cycle. Specifically, the participants uttered I-statements with an overlapping transition to we-statements, before shifting to you-statements on, marking the end of the second macro-cycle. The overlapping marks indicate over-lapping macro-cycles, indicating that shifting frames is a negotiated process.

Verb use appeared to mark stances toward participation frameworks. Starting with Joe's modals of "can" and "would," the participants adopted first person singular + modal verb constructions through. While the "I" turn construction may have foregrounded a more proto-Western individualist perspective, the modal "would" introduced a distance stance between players and role-played character, the maple tree, and thus distance toward a hypothetical world that they did not enter. When the players transitioned to "we" statements, they also adopted present tense verbs, meta-communicating existential enactment of play rather than "overt proposals to pretend" (Giffin, 1990). Additionally, the present tense agentic verb choices indexed

a close alignment between player agency and the enactment of tree agency. Once the present tense collective identity had been established, the group collectively displayed dispreference (Schegloff, 2007) for shifting back toward a modal stance toward their activity.

Finding 3b: Interactive assembling of participation frameworks navigated axiological shifts

In the outside-play frame, the youth were positioned (by the structure of the camp) as learners engaged in role-play to learn about the maple tree plant relative, and Joe was positioned on the outer-frame rim of this activity in the role of filming and collecting data for research purposes. In the inside-play frame, the youth were interactively positioned by Joe as maple trees being interviewed, presumably by Joe, who had been possibly positioned in the inner-frame rim as interviewer by Rihana. The in-frame play itself involved two participation frameworks, the first being individual maples being interviewed and the second being collective maple trees being interviewed.

Joe's use of "you" pronouns were contestably either individually directed or collectively individual, though once Regan repositioned the group collectively (with ratification), Joe's you pronouns ostensibly appeared to function collectively. The I-statements indicated proto-Western individualist stances via pronoun choice and comparative utterances of individual trees as positioned categories (Stokoe, 2012) in hierarchical relation to each other. The implied axiological positioning framed trees as individuals who are compared to each other and attempt to assert their individuality through merits or superior qualities, indexing a Western individualist axiology (Bang & Marin, 2015).

Regan's decisive re-framing of the pretense positionality of the maple trees is ratified by uptake of other participants and retains. Regan's move not only appears to use interactional resources of grammatical pronouns to shift the participation structure, but she also axiologically

re-positions the group's play, a re-positioning that gets explicitly and interactively foregrounded and opens a transition to the next sequence which is not analyzed here (but is elsewhere, see Howard dissertation). Regan's move potentially indexes Indigenous cultural beliefs about collective identity and a category-tied predication (Stokoe, 2012) of trees as collective individuals, especially in relation to plant relatives and in relation to the I-STEAM ethos. This is thus an axiological move as well.

After shifting to we pronouns, the group appears to adopt a collectivist stance, whereby Joe's "you" frames in his reflective questions are now responded to with we-statements that persist uncontested. Furthermore, as indicated in Figure 10, this shift toward a collective mentality also shifted away from comparative expressions to the development of an interdependent network of kinds and trees, culminating in an explication that trees "need a lot more trees" to "share nutrients" and not be "lonely." Thus, this layered assembling of play-and-reflection participation frameworks not only facilitated axiological shifts, but these axiological shifts appeared to afford expansive epistemic action of RD, my sixth and final finding in this episode.

Findings 3c: Collective RD in Transformative Progression of Rihana's turns-at-talk

Collectively, the interaction expansively progressed through micro-cycles of RD that developed onto-epistemological frames of understanding of maple trees (including its attributed actions and attributes), along with pronouns that signaled axiological positions, and verb constructions that signaled interactant stances toward onto-epistemological frames and axiological positions. These transformative effects were poignantly demonstrated in the transformation of Rihana's participation in the activity, repeated here for ease of reference.

14. I would grow the tallest

38. I'm a maple. See? I'm a maple
- 41,44. =[and then I s—and I stop. ((inaudible)) [And I then I just—((shakes head).
66. We need water and rain
72. No we need (.) more maple trees, right? (..)
75. WE MADE 'EM
54. We need more
65. THE POWER OF [OXYGEN
67. But we need a lots (.) more trees (..)

Initially, Rihana adopted a first-person singular stance that was hypothetically comparative and potentially competitive with other characters. Initially, she relinquished the modal stance, yet still retained an individualist frame. However, through the persistence of her playmates, she adopted a we-identity with we-intentions by. Furthermore, she transformed the volitional discourse from “want” to “need,” layering a sense of urgency and dependency that de-anthropomorphized trees and foregrounded their necessary relations to their ecosystem. She then expanded both the collectivity and necessity of tree relations by arguing (successfully, as indicated by other participant adoption) that maple trees need each other, make each other, and need “lots more” in order to sustain. This is all the more remarkable for how Rihana initially broke from the group, took an interest in Joe, briefly cornered him for exclusive dyadic position, adopted the framing of his initially out-of-frame and potentially Western-laden questions, and then allowed herself to be taken into the collectivity of the group, both out-of-frame as player-hikers and in-frame as maple trees. Just as remarkable is how often Rihana voiced or embodied the stances and actions of her peers while seldom looking back. Indeed, in many ways, while the youngest member of the group, led the group at different junctures, including the extent to which

she held in-frame embodied stances as a maple tree. Indeed, the multi-modal timing of Rihana's actions appeared to do double work, both embodying her character and pedagogically informing Joe what a maple tree would do if it were her.

Finding 4: Learners' Emergent Epistemic Theories Facilitated by Epistemic Action of RD

Through the collective resources analyzed in close interaction analysis and outlined in the above findings, the interactants were able to develop two saliently emergent theories about maple tree ecosystemic relations and actions. By chaining micro-cycles of RD that continually re-used, decomposed, transformed, and layered I-STEAM connections, the players generated a macro-cycle that of RD that evidenced five significant developments (Figure 10). Joe's reflective questions exhibited substantial framing power, proffering verb stances that were quickly adopted, though also contested. By shifting framing of questions, reflective orientations shifted from out-of-frame story-building stances to in-frame story enacting stances. Furthermore, led by Regan's persistent invocation of an axiological we-identity, the group adopted we-intentionality, as evidenced in the transformation of Rihana's turn-constructions. Collectively, the group developed a theory of tree assembling or configuration as a networked webbing of relations in the assembling of an ecosystem with agents and kinds from the perspective of maple trees. Furthermore, they animated the maple trees relation to its ecosystem by layering (Thurtle, 2014) trees, place, kinds, motivation, power, collectivity and self-determination. Led by Rihana's transformation of relational motivations from individual desires ("wants") to interdependence ("needs"), the group proffered an emerging theory of collective tree autopoiesis.

Appendix F: Entire LARP Data Corpus Findings and Discussion of Text Transcriptions

In this Appendix I will first summarize my key findings, briefly discussing each, before providing a more in-depth summary of my analyses that support these findings.

Findings Summary

The findings here are consistent with several tenets in theories on pedagogical communications and reflective discourses. In order for collective reflective action to take place, contingent relations appeared necessary, as evidenced in the data of interactive signaling of contingent responsiveness. Furthermore, evidence was provided linking unsuccessful attempts at collective reflection to absence of contingency marking in the interaction. Theoretically, I had proposed that contingency was implicit to establishing the phatic connection of the relationship, akin to primary intersubjectivity, in which frames were advanced, negotiated, and aligned. In other words, frame negotiation signaled contingent interactivity, evidenced through addressivity and adjacently paired turns. Furthermore, contingent interactivity was characterized by attunement to, involvement with, and engagement in the unfolding activity (Sidnell, 2014). Phatic connections in turn afforded particular arcs of interaction. How activities were framed during launches shaped observable phatic connections, reflective potentials, and epistemic actions.

Significant variations in reflective actions and epistemic actions were also evidenced depending on whether bodies were hiking together or anchored together in a single space for the duration of the activity, a difference which I gloss as “geographic variation,” which in turn advances the notion that mobility in place is part of place geography. Generally, “on task” activity engagement appeared much more consistent in anchored locations than during hikes, and play-and-reflection was consistently woven throughout such activities. The links between play

and learning were complex and variable during hikes. Hikes had more or less play, more or less adult involvement, and more or less reflective action. The design of LARP hikes called for adult facilitation, or mindful presence at minimum, and each launch tasked students to engage a perspective-building role-play activity. Hikes that adhered most closely to this launch frame did exhibit high levels of play-and-reflection, with learning in alignment with stated I-STEAM learning objectives. Hikes with adult involvement but less play still exhibited high levels of reflective action, predominantly mediated by land-based mediations of exploration-and-reflection (Note: while beyond the scope of this dissertation, developmental studies of play often argue that play is a precursor to exploratory behaviors, and exploration is even categorized at times as a form of play). Hikes with no adult involvement exhibited high levels of play, creating imaginative spaces with fictional storylines. Integration of I-STEAM language was less frequent compared to other hikes, when it occurred typically the language was carried forward with little conceptual elaboration, often laminating fantastical elements onto constructs (such as acting as though sword ferns literally gave players the power of swords). These playful forays opened up explorative pathways into ecosystemic perspectives and capacities, however little evidence was found of converting these pre-reflective potentials into explicitly reflective learning about the ecosystem.

Marking was a salient feature of all interactions. In addition to contingency, contextualization cues, pretense markings, ostensive markings, indexical markings, and cultural markings were all prevalent. Contextualization cues were continually signaled to establish or affirm the framed tasks, to vie for counter-frames, or in certain cases to effect reversals in which assigned tasks were dismissed as dominant youth pursued frames of their own interest (e.g., playing Pokemon Go). Playful keys dominated the data, likely given the design of the activities.

However, youth still needed to mark when they were in or out of a play frame, and what kind of play was in play. At times, such as the case of Kal during the 2015 Finale, adults appeared equivocal about which forms of play were sanctioned and which were not, and mixed interactive signals made unclear whether Kal was even permitted to participate in the kind of play sanctioned for the Finale.

Reflective shifts were often marked implicitly through prosody or embodied actions that were disjunctive from projectable actions. If a sentence was unfolding in a projectable manner, the speaker might slow down or stutter to ostensibly mark the subsequent words. Bodies would stop moving and anchor in a particular orientation to draw collective attention toward what came next. Importantly, perhaps due to the instructional nature of the space (Seedhouse, 2004), questions served as a dominant ostensive marker, inviting social distribution of PCs and RDs. Quite regularly, reflective spaces were ostensibly marked by explicit metapragmatic modalizations (Silverstein, 1993) such as think, guess, wonder, feel, etc. Youth often used environmentally coupled gestures (Goodwin, 2018) to index connections between discursive content and environmental features. Evidence was also found supporting the claim that youth consciously orient to culture, mark the “cultural” as such, and interactively engage with an awareness of multiple cultures.

As Salmon (2016) observed, play was readily interleaved with reflection in reciprocal cycles of progressive expansion. Play not only generated playfully keyed phatic connections, but also revealed how interactants engage play objects (physical or ideational) as pre-reflective substrates with potential to be transformed into reflective objects in subsequent action. Initially, laminating play-and-reflection was scaffolded during group retelling of Grandmother Cedar story where players were introduced to the lamination of embodied actions onto unfolding narratives.

As groups transitioned to more open-ended story creation of LARP, narrations began to follow the lead of emergent and spontaneous embodied moves, that themselves were responding to previous embodiments and narrations. To start a given activity, facilitators often engaged in “preflection” (Falk, 1995) exercises, cuing up prior shared experiences, prior knowledge any individuals may possess. At times, these preflective cues set the stage for enactment, or at other times, they would set the stage for a novel scenario which then framed subsequent enactment. Once role-play was in action, it was continually laminated synchronically and diachronically (Prior, 1998) with reflective actions. Reflections themselves could be embodied replies to ostensive cues, narrative laminations that made explicit implicit dynamics, or even explicit Cobbian invitations to step back and think about something that had happened. In all cases, reflective actions enabled additional layers of epistemic actions that afforded new grounds for playful engagement.

Data Analysis Summary

Reflective action appeared to manifest in degrees ranging from autonomic (i.e., automatic and minimally reflective) to intentional (i.e., deliberately reflective explicitly directed toward some object). Evidence was found of strictly autonomic reflection; pedagogical communications (PCs) with contingent, ostensive, and referential marking; Cobbian RD in which interactively generated objects were reflected upon by deliberate moves to “step back” and think further about the object; and chained (Cobbian) RD in which the reflective referential-information of one turn became the phatic substrate for further reflection in the next turn. Variations in RD appeared context sensitive: launches (high adult-controlled PC), story retelling (highly distributed PC), pure play (non-RD chaining, high PC), imaginary scenarios (high in all forms), interviews (high Cobbian), and hike conversations without play (all forms). There also appeared to be differences

across particular facilitators, who played forward their own cultural historical pedagogical practices. For example, McG stood out for how she synchronically layered both play and reflection in her own utterances, often using her playful move to offer additional info, whereas Priya tended to build on emergent play of others to ostensibly mark reflective spaces for others to share their knowledge. Joe typically engaged less embodied play and instead focused on playfully imaginative discourses to seek out youth-produced substrates for chained Cobbian RD.

There also appeared to be differences across age groups, suggesting variations in age-mediated cultures. Younger and middle student groups tend to sequentialize story retelling and then imaginative scenarios, while older students appear to layer imaginative response (often in a key that may be more sarcastic and metapragmatic) into the initial story retelling. Older student activities also appear more abbreviated (see also Elkonin, 2005). And often with mixing the ages of groups, youth repeatedly demonstrated their capacity to engage each other in reflective discourses and peer to peer mentoring (Regan 7.19, Joh 7.20, Dale 7.20, 7.30 hike, Dale 7.21). While Eberlach & Crowley (2017) argue that parents/educators need both subject and content knowledge for their children to succeed, this study shows that these capacities can be distributed across the activity system. Just as Eberbach & Crowley noted how 30 minutes of scaffolded instruction on conversation elaboration strategies changed parent conversation patterns, Regan (BLM 7.19) showed how 15 minutes of RD interaction that wasn't even designed to explicitly tell her to adopt chained Cobbian RD helped modify her immediate discourse patterns with Rihana. Key to this may have been the role alignment in which Regan had been positioned as a facilitator and Joe functioned as a facilitator solicited into interaction explicitly by Rihana.

While play-and-reflection were continually layered (through body, Cobbian RD, and PCs) to build playful-realistic perspective of eco-behaviors, relations, and emplacements, the role

of place and land was undeniable. This is not a surprising finding given that design of I-STEAM as an outdoor camp integrating environmental educational sensitivities as part of the broader project at raising land-based awareness of Indigenous and Western Scientific practices. Place-based explorations mediating reflective interactions were found in numerous data points (e.g., Priya 7.20, Dale 7.19, Joh, 7.20, Pearl 7.21; Dale 7.21, Nat 7.21, Finale, 7.22). When the “perceivable” environment was involved, reflective interactions potentially shifted, as the environment may have provided substrates for ostensive questioning and mediation of referential replies. Doing LARP scaffolding outdoors in the relevant ecosystem afforded access for constraining how in-frame play of the same ecosystem could unfold. The play was open and emergent, but not infinite, constrained by and linked to the same ecosystem they were learning about as part of I-STEAM. The affordances of play already allow easy movement in and out of play frame, or to the rim of play frame for projecting play scenarios, and layered with embodied interactions with relevant ecosystem, students were able to utilize constrained but open play scenarios to think through (reflect on) relations of actual ecosystem. The players laminated a contextual configuration of the semiotic field of embodied play, semiotic field of ecosystem knowledge, and semiotic landscape of the physical environment they were part of. The themes of the LARP scaffolding exercises were designed to align with I-STEAM knowledge grounded in actual ecosystemic behavior. Thus, play scenarios given to students during exercises were designed set up conditions for this potential alignment, and indeed in their emergent play, student-players often learned the realistic connections of these events (e.g., crisis, displacement, new land relations in Priya’s 7.30.15 data).

As a design pragmatic, LARP at each the start of each camp was grounded in the Grandmother Cedar (GC) story, using an Indigenous and ecosystemic relevant story as the point

of departure for developing scaffolds linking narration and embodied action. Subsequent small group activities focused on rehearsing these connections as substrates to practicing the characteristic participation framework of LARP: scenario prompting imaginative responses, emergent embodied action, narration of what emerges, leading to more emergent actions and narrations until next scenario introduced. In story retelling, focus was on narration first, and then embodiment second. In scenario framing, embodiments typically came first and narrations followed, leading to more embodiments. The distinction appeared to be that narrations in story retelling appeared more as basic PC and narrations in scenario framing appeared more as Cobbian RD.

Across the scaffolding exercises, launches provided initial activity and interaction frames, which in turn shaped the possible phatic connections that might ensue as smaller groups assembled. These launches were adult-led, often with an adult facilitator speaking to a large group that the facilitator would not be continually engaging during the activity, and often engaged PC, though participation in PC was less distributed than activity-based PC (cf. launches with PC-heavy activities, such as Pearl, 7.21; Finale 7.22). While launches set in motion particular frames and possible phatic connections, much of the unfolding activity drew on interactive resources of play-and-reflection.

Structural Affordances of Play-and-Reflection

Specifically, the interactive structure of the role-play provided salient interactive resources for learning through play. The problem of figuring out how becoming a plant-body with a human-body, what I refer to as the human-plant body problem, was a frequent pivot that may have facilitated perspective-taking on embodied cognition, which is to say that players became simultaneously more aware of their human thinking-bodies and the thinking-bodies of

plants (e.g., Joh 7.20). A similar pivoting relation between human and non-human was seen in affective relations, such as youth toggled in and out of the play frame when considering edible plants in terms of bear characters and their own (human) desires to actually eat the plant (e.g., Priya, 7.20). Generally, as a practice, Priya and Joe used pivots to link human perspective/affects to plant perspective/affect.

Structural Affordances of PC

The structure of interactive mediations of RA also appeared to be a substantial interactive resource for pedagogical interactions. For example, the contingent relationality which would cohere a smaller group throughout the activity usually came after launches as smaller groups worked out the task they had been assigned. For example, in Pearl 7.21 and Priya, 7.20, Priya drew the groups together by actively soliciting everyone's attention and providing verbal directives for how everyone should orient their mental and embodied presences to develop frame alignment on activity. In general, these initial group gatherings that reviewed the launch and clarified the task set in motion the frames and phatic connections of group co-operative action (Goodwin, 2018). For example, all of the 7.20 LARP hikes launched with groups reading aloud plant cards. How the groups read the cards appeared to shape uptake of their content during the hikes. Dale appeared to reuse the language of the card multiple times, as he was the reader. Priya drew on specific insights of the card and kept those in circulation as they engaged in place-based reflective explorations.

Priya 7.31 evidences another example of how practitioners layered contingent responsivity into the phatic connection and interactive framing of the activity. Priya appeared to have an idea of the scenario she wanted to create (e.g., shelter, birds, differential sizes for predator-prey relations) but she left the details open to student contribution. This frame-setting

action was pedagogical (as evidenced in many places) and it largely relied on discursive chaining and social distribution of PC rather than Cobbian RD. Through discursive chaining utterances were utilized to play forward the scenario. The chaining may not have been highly reflective (i.e., predominantly strict PC and autonomic), but was geared toward building the imaginary world.

Discursive chaining may have specifically helped students think through linear causality and temporal sequentially, such as seasonal or life cycles. However, eco-webbing could happen without discursive chaining (though likely requires some nonverbal chaining in order to harnesses continuity requisite for webbing to happen at all). Webbing was often around a common affect or node (e.g., water in Dale hike, 7.20). Affects can be used as pivots to web together relations that were not obvious, such as “who eats salmonberries?” leading to a webbing of salmonberry eaters. Indeed, evidence was found supporting the view that different activity systems can mix without prior chaining to prepare them for their crossover experiences. Certain affective relations, such as near-universal connection to water, often appeared as a mediating connector between different migrating groups with different playworlds in motion. The crossover of these playworlds was made possible by these affective commonalities (see crossover of Joh 7.20 & Dale 7.20).

Reflective Objects

The data exhibited considerable range in what could be taken up as a reflective object. For example, in addition to affirming what had been observed in prior research (utterances, actions, environmental entities and relationships, ideas and thoughts, feelings, and bodies), data evidenced unexpected substrates for reflective action: axiological stances (Priya 7.30); a story told over several turns (7.27 GC debrief, 7.18 GC); consolidated summaries of prior shared

experiences (Joh 7.21); perceptual gestalts (Priya, 7.20). Axiologies, in particular, which were foregrounded in I-STEAM values explicated throughout camp activities, abounded in the data, often implicitly in interactions (phatically layered as autonomic reflections), and at times made more explicit through intentional reflections. More generally, reflective objects were constructed out of the interactive work, where several turns of thinking got consolidated into a cohered discursive object in a single turn that could serve as a substrate for reflection. One effect was that participants could evaluate the discursive objectification of several turns and ratify, reject, contest, or modify. The perception of place as shaped by cultural practices also became an explicit object of reflection. KAQs, open-questions, and referential knowledge shared during PC activated cultural knowledge practices. For example, during Priya, 7.20, Thunder reflected on how an object looked to him like a turtle, and his interactive moves suggested that he did not expect others to perceive the turtle, an interpretation further backed by how he explicitly linked his perception to the beliefs of his tribe. Priya further linked the perceptual laminating of turtles onto the semiotic landscape of another Indigenous elder, affirming not only the role of culture in environmental perception and meaning-making, but specifically the meaningfulness of Indigenous cultural practices.

Overall, LARP allowed adult facilitators to tease out learner eco-perspectives and help imagine their consequences through role-play. For example, the question of “centricity” is central to I-STEAM, with a general interest in troubling egocentric views that privilege human or individualistic perspectives. While Indigenous peoples strongly grounded in their cultural-historical IWOK typically do not require “decentering” education, as such onto-epistemologies are already part of their worldview, LARP created opportunities to see if youth had also been influenced by more traditionally Western ways of centering individuals. For example, often

youth perceived salmonberry as creating shelter for hawk, perceiving the hawk-SB-shelter relation in terms of a teleological stance in the SB, as though it intended itself to be used as shelter. Without parsing this stance, its pronouncement often occluded an eco-affordance perspective that might have oriented to the Hawk's affective needs, perceptual capacities, and sensorimotor agencies to perceive and act on SB transforming its structure to a form of shelter. However, by surfacing which perspectives were set in motion by particular scenarios, facilitators had a chance to pivot on those perspectives and develop them as substrates for further reflective action, including RD and playful exploration of varying hawk-SB-shelter interactions.

Off-Task LARP

Not all data tasked with engaging in LARP stayed on task. Spontaneous and unexpected moves by youth, at times quite persistent (e.g., Finale 7.31 Kal as Ewok; 7.19 BLM-b Maple in a Subway; Dale 7.20 "cacti invaders") exemplified how play can take the projectable trajectory of instructional interaction away from designs or facilitator intentions, and yet can be folded back into the discourses of the camp. Chaining the phatic connection (where in both referenced cases youth insisted on retaining an off-kilter frame) to Cobbian RD showed the value of youth stances. In both cases, themes of migration across ecosystems emerged, challenging interactants (and surprised adult facilitators) to think about migratory relations as presented in playworlds (cactus, ewok) and responded to in different ways (cacti are invasive; Ewok is grounds to be banished from playing).

Non-LARP interactions pervaded during LARP hikes. This did not always compromise learning, however. During the youth-led Dale 7.20 and 7.21 hikes, spontaneous and emergent non role-play subsumed the learning constructs, nominally integrating I-STEAM language but doing so in terms of the figured playworld emerging through youth interactions. Thus, play that

was not LARP-oriented was still a way to build familiarity with concepts, identities, and phenomena that might later serve as reflective substrates, even if initially such reflections did not take place at the time (Dale hike 7.20).

Dale and Charlene engaged in a discourse in which Charlene spoke in predominantly non-distributed verbalization of PC, didactically teaching Dale through place-based observations (autonomic reflections) of chestnut that induced Charlene to recount to Dale her family traditions in Ohio around buckeye chestnuts. While Charlene did nearly all the talking, IA shows that maintaining contingency and phatic connection was still interactively constructed.

In some adult-facilitated hikes that did not engage role-play, playful affect still pervaded the phatic connection, and reflective actions suggested how place-based scientific argumentation shifted attention to place-based perspectives, rather than persuasiveness of verbal arguments. For example, Priya and Thunder (Priya 7.20) used place-based evidence (presence of dragon flies to infer presence of water underneath horsetail; brittleness of horsetail) to make inferences about the effects on horsetail in growing in a wet area not under canopy cover.

Overall in Priya 7.20, place rather than role-play, was the driver of discursive reflections, meaning that the substrate/object started with human-place interactions (via cultural meanings contingently activated by place) and carried on in human discourses that continued to anchor to place and draw further reflections by integrating more features of place. The kinds of questions that could be asked of an ecosystem shifted dramatically when in that self-same system. For example, Priya asked spatial orientation questions that afforded reflections on spatial relations of neighbors. Through multiple macro-cycles of discursive chaining and environmental webbing, Priya 7.20 exhibited exemplar instances of place-mediated Cobbian RD. This finding significantly expands the Cobbian frame, which (implicitly) treated classrooms as a backdrop to

mathematical objects and discourses produced by teachers and students. Here, land is accorded a central and driving presence in the mediation of distributed RD, affording chaining of discourses and conceptual webbing of eco-relations.

LARP Finales

LARP finales provided opportunities for players to enact a full-blown Pacific Northwest ecosystem playworld during continuous hour-long play. LARP finales were clearly structured differently than scaffolding exercises. Scaffolding exercises layered narration, play, and reflection while the finales did not have formal breaks in order to reflect. This appeared to affect the kind of reflections that occurred. LARP finales appeared to be more autonomically reflective, presenting the potential for reflective understanding of ecosystemic relations and behaviors, providing opportunities for players to continually embody nonhuman perspectives, affording a MTH perspective of the continual re-assembling of ecosystems over multiple seasons and years. Considerable knowledge was layered through PCs and autonomic reflection, though not really turned to intentional reflection due to the structure of the finales. In other words, the purpose of the finales was not so much to reflect on substrates (with reflective object potential) as to chain together substrates for the purpose of advancing play. Indeed, for this reason, finale design included debriefs after the finale, both walking back to the main center and in pulling youth aside to discuss. During these finales, much of the referential knowledge of PCs was provided by adults, which was in contrast to scaffolding exercises where there was more distribution of PC. There appeared to be less Cobbian RD of stepping back and considering what was happening, and more PC that commented/narrated as the action continued to unfold. Nonetheless, sustaining play required some level of cognitive awareness of play frames in motion for players to remain

meaningfully engaged in play. Indeed, the numerous layerings of PC to narrate action indicates that players were meaningfully engaged.

At the same time, during LARP finales, and live play in general, evidence suggests that perspectives were revealed not just in utterances, but in interactive situations whereby interactants adopted particular stances toward the interaction, which in turn revealed perspective. For example, during the LARP 2016 Finale, Raven (Jeanette) showed indifference after discovering no relations with an interactant—the indifference of a raven that we might observe in actual world when it appears to ignore so much while focusing on particular objects. Again, during the LARP 2016 Finale Raven was distracted by some apparently friendly characters as predators moved in on her. Additionally, the way players warned each other of certain events (fire, predator) to a degree simulated that ecosystems do have signal relays that animals and plants have learned to read, such as during the LARP 2016 Finale when Raven was warned about predators by vigilant relatives).

Based on player debriefs, it is unclear if players ever intentionally reflectively attuned to the reflective potentials encased in interactive situations during play. Students often appeared reluctant to speak during debriefs, perhaps due to explicit nature of reflective process. They may not have much understanding, may have developed implicit understanding but not explicit, or may find the participation structure to dissuade them from sharing explicit knowledge. However, when youth spontaneously initiated debriefs, either with each other or with adults (e.g., LARP Finale 2016), as opposed to when debriefed by adults, there were notable differences in how youth were more excited and eager to share the range of characters they inhabited during play. However, persistently patient questioning from adults did generate noteworthy responses from debriefing youths. In the LARP 2016 Finale Debrief with Priya, players identified sadness,

loneliness, importance, and power as key discoveries made in emotionally attuning to the different perspectives of their characters.

From debriefs, youth appeared most excited to talk about killing other characters, and predator-prey relations, which at times veered into murderous relations, appeared prevalent in 2016 Finale (though not as much in the 2015 Finale). What might account for this? Interactional evidence appears sparse, though a large expansive outdoor setting affording chase scenes, as well as the predilection for Changer to cast characters as animals, may have foregrounded predator-prey relations. Additionally, the ever-increasing attention in the media to mass murders may have also created some of the cultural backdrop to play themes; indeed, one of the primary functions of open pretend play is for youth to appropriate and “play with” cultural tropes in the media (Edwards, 2016). While the finales helped youth engaged in predator-prey relations connect to exhilarating and fearful affects (and the embodied actions set into motion with these affects), it may have also helped players positioned as plants throughout play to connect to different kinds of affects. Players who were plants reported during debriefs that they did not get much interaction, that they were often passed over by other characters, and they generally conveyed low affect and low enthusiasm for the finale. However, they foregrounded elements of the ecosystem such as wind as providing comfort and interaction, suggesting an emerging series of affects, relations, and eco-kinds that do not immediately come to mind when imagining a LARP ecosystem, or any kind of actual outdoor ecosystem.

In both finales, certain exchanges revealed boundaries of ecosystem in both playworld and assumptions academically about ecosystem boundaries and dynamics. In the 2016 Finale, for example, Trickster interactions surfaced these boundaries, through games within the game. During 2015 Finale Scaffolding and the 2015 Finale Kal insisted on being Ewok, showing the

kind of interactive work youth may do with adults as they advocate for their agentive participation in the joint accomplishment of Cobbian RD. Initially, Priya and Alice appeared to sanction his choice to be Ewok. However, as groups mixed, McG countered that he must choose a relative in the relevant ecosystem of leave play altogether. Kal's insistent stance, on both remaining in play and being Ewok, his agentic defense of a culture and species not otherwise gaining recognition as foreign to the enacted ecosystem, ultimately lead him to demonstrate his knowledge of the eco-relations that an Ewok would encounter in their playworld ecosystem. Kal's resistance showed how all involved in this negotiation stood to reflect further on the relations of foreign species (biologically and culture) to existing native ecosystem. Even the negotiation itself enacted the considerable work foreign relations and native ecosystems must do to integrate with each other in forming a new kind of ecosystem.

Identification Q&A. In the 2016 Finale, identification Q&A appeared most prevalent. This prevalence may be a function of how discourse formats of participation structures were framed during launches. Over the final three days of camp, launches focused on not outright telling each other who they were, but on creative ways to reveal and guess identities. Indeed, this design change in 2016 was motivated by review of 2015 data that indicated how quickly players revealed their identities to each other. Presumably, such quick revelations belied the cognitive-perceptual work beings must engage to discover identities in their lived-world. The hikes of previous days leading up to the 2016 Finale gave ample opportunity to practice identification Q&A and data evidences this happened with most hikers.

The 2016 LARP Finale launch surfaced an interesting negotiation between Game Master (and game designer, Gabe) and youth around the parameters of play. The negotiation centered on "the one rule," the prohibition to ask another character, "Who are you?" This discussion

appeared to gravitationally pull players toward the frame of identification Q&A, which in turn seemed to dominate the Finale as it unfolded. This was in contrast to the 7.20 hikes, which were framed by a similar prohibition, where once identities were established players focused mostly on what they did together. While McG's 7.22 Finale interactions were similar to Gabe's 7.20 hike, focused on what identified players do together, McG was mostly on the periphery during the Finale. In Finale 7.22, Jeanette had much greater interaction density and exhibited a far greater orientation to identification Q&A. Indeed, contrasting the two findings suggests that interaction density differentials may shape potential durations and foci of interactions.

The frame of guessing each other's in-frame identity afforded a distinctly different kind of layering of play-and-reflection, with reflection distributed differentially across participation structures. Overall, these activities illustrated how identity is constructed out of webs of relations, including behaviors, affects (eating habits, predators), locales, habitats, neighbors, and so on. During the Finale, before identities were discovered, the question asker was reflecting on which kinds of questions to ask, which required them to think about how to identify a species, and the answerer was positioned to provide answers that may require some reflection, but mostly provided phatic grounds for further question-formulation. In other words, this structure led less to discursive chaining (and thus less RD Chaining), and to more webbing. After identities were established, references appear unanchored in discursive substrates, PCs were detectable but appear unlinked, and numerous pre-reflective objects were generated, but the discourse format did not appear to afford an orientation toward transformation into chained reflective objects. Instead, after identities were established, role-play proceeded according to situational affects (Pearl, 7.21; Finale 7.22). For example, in the Pearl 7.21 hike, once identities were established, food dominated as a theme, linked to hiking the land (in which the hiking human body became a

pivot for bear speeds of movement) and blackberry abundance for eating (in which blackberry pivoted as food both for out-of-frame humans and in-frame bears). Food and eating became an affective relation that bound the webbing of characters throughout the playworld.

While the PCs of the “Who are you?” identification activity framework didn’t appear to afford Cobbian RD in short exchanges, PCs did emerge throughout. Furthermore, a new kind of RD arguably appeared when considering character identities as underlying substrates for further action. In other words, while RD may not have been Cobbian, not characterized by explicitly stepping back to think aloud further, subsequent embodied actions reflect choices that themselves must have been reflective of cognitive processing of the meaning of particular identity characteristics. In a certain sense, while slow developing, the characters did stay in character and focused on developing their identity, primarily through food relations. In this sense, each newly shared or discovered link to the character was a role-play mediated reflection on the character’s capacities and relations.

In some cases, such as McG, once identities were worked out, role-play ensued with co-exploration, often around the affects of eating and exploring. Noteworthy was that McG fostered this across LARP activities. Additionally, during the LARP Finale, McG and her co-participants were relatively removed from frenzied heart of action. In other cases, such as with Jeanette, identification process dominated and once identities were worked out, a quick role-play would ensue in which expected interactions followed (e.g., once Raven established that she could eat a berry, she would eat it and then move to the next interaction). However, Jeanette’s method of Q&A identification was highly pedagogical, modeling the kinds of questions that one would ask were one to query the eco-relations of an unknown species. Indeed, Jeanette’s identification practices revealed as much more complex (and webbed) process than simple “who are you?”

naming. They followed a logic from place down to body characteristics, webbing together place, eating, neighbors, life cycles, seasonal affects, etc., in addition to physical characteristics.

Were these forms of interaction less emergent, since the focus was on guessing a pre-existing identity, then playing out a predictable scenario following from identities? As opposed to known identities, when players persist together, rather than dissolving the interaction to move onto a new one, emergent things happen. In LARP 2015, for example, characters often clustered together, making visible neighbor relations and gifts. Identification Q&A did not necessarily need to be the frame of activity interaction, but became the predominant form. It could have gone differently, with players talking aloud about themselves, as Gabe did on the 7.21 hike. At times, this discourse format got disrupted, such as with the discursive practices is Isabell, when youth eventually offered revealing info about themselves without prior Q&A prompting, quickly leading to a shift from identification to role-play immersion. However, such role-play quickly resolved and new Q&A interactions began.

Discussion: On Play-and-Reflection

Affirming Solomon's (2016) finding about cycles of play-and-reflection, across the findings here it appears that "play" in various forms—word play, interactive play, playful affect, affective play, pretense, and role-play, at a minimum—affords and constrains emergent opportunities for pedagogical communication (PC) and reflective learning, which in turn shape where play may go next. The findings here evidence how interactants during I-STEAM LARP co-created micro- and macro- cycles of play-and-reflection. They used these cycles to build up time-spaces of reflective discourse (RD) out of situatively created playworlds typically thematized around I-STEAM axiologies and onto-epistemologies and always shaped by interactant life-histories.

These findings expand on what we learn analytically from looking at interactively constructed cycles of play-and-reflection. Cycles in the data tended to be either chained together through linguistic symbols in discursive content or webbed multi-modally through synchronic and diachronic epistemic actions. If the smallest micro-cycle is a single linking of play-and-reflection, chaining is the linking together of two micro-cycles. Multiple micro-cycles of play-and-reflection chain or link into macro-cycles.

Macro-cycles themselves appeared to be dynamic, plastic, and highly variable in duration and extension. Macro-cycles could overlap or be sequential, continuous or disjointed, chained or not, dropped and then taken up again later. While interactive processes mediated how one macro-cycle was linked to others, these processes were highly variable (connective, disjunctive, interruptive, embedded, etc.). Complexity of discursively mediated thinking may have been evinced through the embedding (Goffman, 1981) of macro-cycles within broader macro-cycles, either as separate but connected macro-cycles or as sub-macro-cycles building up a larger macro-cycle.

In the LARP data, I found evidence of multiple macro-cycles in a single activity, identifying shifts from one macro-cycle to another through analyzing the relations of their respective micro-cycles. The micro-cycles of a given macro-cycle worked together on a particular, un-transformed substrate. Changing from one macro-cycle to another entailed transforming the substrate, which was again evidenced across the micro-cycles of a given macro-cycle. Each macro-cycle entailed a layering of a new frame of interaction which itself may have entailed shifts in participation structure, participation statuses, phatic connection, pre-reflective interactive substrate, reflective object, and so on. Of specific analytic interest in the present study

were macro-cycles that evidenced transformations of pre-reflective substrates into reflective objects.

In total, macro-cycle change was interactively constructed and negotiated. Nonetheless, interactive evidence suggests that facilitators (typically but not always adults) had significant power in introducing new macro-cycles. When able to seize some appreciable interactive power, youth would often do or say something that layered on a new macro-cycle. Youth engaged each other differently, able to draw on youth cultural logics and referents that were analytically detectable in the data as interactively constructed membership categories (Stokoe, 2012) of youth culture. In MC theory, culture is interactively played forward in the linguistically visible categories of interactants. Research in MC theory shows how culture receives much of its dynamism through interactive negotiations on cultural meanings that evidence how negotiable MCs can be to interactants. The MCs of youth were somewhat distinct from the MCs of the I-STEAM camp stated values. This difference created tensions that gave shape to the cycles of play-and-reflection.

In short, while macro-cycles were heavily inflected by the interests and power of the I-STEAM design and facilitating teams, youth interests independent of I-STEAM interests inflected macro-cycle trajectories as well. One salient and readily available linguistic-interactive resource for negotiating frame alignment was evidenced in pronoun choices made by interactants while constructing cycles of play-and-reflection. Pronoun shifts signaled movements in and out of play-frames and potentially signaled macro-cycle shifts. For example, first person pronouns typically marked in-frame stance alignments with a particular character in the playworld, while third person pronouns signaled willingness to participate in the discourse about the playworld, but not with the playworld.

However, macro-cycle shifts were more complex than simple shifts in pronoun stances toward a frame, as evidence was found that pronoun shifts could be used for maintenance of the same macro-cycle, also implying that single macro-cycles held multiple frames. However, even when maintaining a macro-cycle, pronoun shifts hinted at their capacity to change macro-cycles. Shifting out-of-frame, such as through pronoun use, often functioned to foreground the importance of a particular connection that was being made during play-and-reflection, to amplify the value given to a particular reflective observation (Priya 7.31, Mixing, 7.30). As these connections accumulated, such as through repeated pronoun stances out of alignment with a dominant pronoun stance, frame negotiation intensified, and ultimately new frames came into play.

Pronoun shifts were a low-material, quick-acting semiotic resource for moving in and out of frames. The linguistic use of pronouns to move in and out of play frames evidenced their use as pivots (Vygotsky 1966/2016) in play. In play theory literature, pivots allow toggling of attention between real and pretend worlds, enabling porosity between in-frame and out-of-frame actions. In the data, pivots enabled simultaneous negotiation of in-frame and out-of-frame happenings, as well as negotiations about the meaning of play and future actions in play on the rim of in-frame play activities, without ever fully leaving the in-frame action. Bodies appear to be pivotal pivots in play, perhaps unsurprising from a phenomenological embodiment perspective. Through the body's pivoting capacities, it is an ideal medium for mediating the phatic connections weaving together bodies and lifeworlds. As a medium for reflecting with, the body may provide an ideal pivot for transforming phatic connections into reflective transformations. Thus the body appears repeatedly in the data as a pivotal source for engaging playful and reflective processes. Pronoun shifts immediately transform the body's stance toward

unfolding action: standing in the action, outside the action, facing the action, and so on. Evidence showed that the more youth enacted playful ideas (either in response to narrative moves, or prior to), the more their pronoun uses shifted toward first-person stances in the frame of play. Their same body which did human things became the medium for thinking and acting out how to become a plant or other non-human relative.

Pivots also appeared to be interactively useful in linking up micro-cycles—webbing or chaining—into macro-cycles of shared discursive time-spaces. Pivots appeared to both bring the actual environment into an imaginary world and at times fortuitously facilitated a deliberately reflective-referential layering of the pivot into the play. Fortuitous pivots are pivots integrated into the playworld becoming part of its substrate, such as an eagle flying over that immediately was taken into the playworld to think about plant relatives providing shelter. Sometimes pivots appeared to regulate interactional norms and appeared otherwise to be temporary distractions from the progressive interaction, such as the eagle that flew over, stopped a launch, and then was chained no further into the progressing cycles of discourse.

While the distracting pivots may have been necessary to keep the play-frame moving forward without being halted by actual environmental distractions, fortuitous pivots were often deliberately integrated to make reflective transformations on the play substrate. Even more specifically, evidence was found of deliberate integration of pivoting into the play to do dual work of laminating rim of frame tasks to in-frame tasks while reflecting aloud what was being learned (evidence of this found in Joe 7.20).

Taken together, these interactive affordances of cycling play-and-reflection made it possible for pedagogical interactions to happen at any point during LARP—during launch, during play frame negotiations, during “tangential” actions during designed activity, and as

activity closes down or after it closes. Pedagogical interactions took up substrates of play or play-and-reflection and transformed them for deliberate pedagogical intentions.

As a pedagogical resource, play-and-reflection appeared to be a way of building familiarity with concepts, identities, and phenomena that would later serve as reflective substrates. Some of these phenomena, however, never appeared to be realized in Cobbian RD, meaning that while they surfaced as pre-reflective substrates with the potential to become reflective objects, such reflective transformations did not appear in my IA of the available data. While at times my theoretical-analytic lens may be off (such as due to cultural biases in my habits of thinking), I do speculate that indeed there are varying degrees to which pre-reflective experiences get transformed into reflective transformations. To reveal the side of experience that shades toward pre-reflective experience that has not been transformed into reflective experience, I operationalize “pre-reflective” as a qualifier of certain kinds of experiences, substrates, objects, and so on. Interactive play, in numerous forms (emergent, spontaneous, discursive, role-played) develops pre-reflective substrates with the potential to be transformed into reflective objects. Data findings here evidenced interactional use of humor, such as sarcasm or silliness, that disrupted the projectability and progressivity of certain participation frameworks in motion, affording new arrangements of participation frameworks, new possible frames, and emergent affordances for reflective action.

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Endnotes

ⁱ The “invitation” or “offer” by the teacher to “step back” is akin to what Dewey (1910, 1933/1998) has referred to as the suggestive function of reflective thinking. Central to Dewey's conception of reflective thought, then, is the notion that something present suggests (implies) something absent that causes an affective disruption, instigating reflection.

ⁱⁱ “Environment” is an immanent phenomenon that includes all things, and does not stand “outside” of anything

ⁱⁱⁱ Nota Bene: It's possible to keep building more layers of reflection. For example, "the chair is brown" could be autonomic, "why is the chair brown" could be intentional, and "why do you think the chair is brown." However, this potentially opens up an ambiguous number of variations and can make analysis messy. To keep analysis useful, the latter two questions are both variations of intentional reflection, because they both direct reflection in particular ways, even reflexively. While I have entertained adding a third layer, reflexive reflection, I have resisted this urge because it implies an ontological distinction between reflecting being and environment, while I have opted to view environment as immanent to all beings, in which all distinctions drawn between the two are onto-epistemological, and not ontological. Instead, I have developed the construct of chaining to account for iterative reflections on the same substrate.

^{iv} This implicitly theorized temporal sequentiality is called into question in this study; while at the same time affirming their developmental and temporal linking, this study suggests a variability that may be cultural, geographic, and situational.

^v In addition to phatic/contingent and ostensive-referential communications, contextualization cues (or frame meta-communications) were also continually signaled to establish or affirm the framed tasks, to vie for counter-frames, or in certain cases to effect reversals in which assigned tasks were dismissed as dominant youth pursued frames of their own interest (e.g., playing Pokemon Go during LARP 2016). Furthermore, environmentally coupled gestures indexing culturally mediated semiotic fields were also prevalent.

^{vi} While I code this as a RP-RR dyad here, its function is more phatic (autonomic) than referential (intentional). As I argue in this paper, all communications are both phatic and referential (Žegarac and Clark, 1999), though one or the other aspect can be interactively foregrounded. I would add that this is also the case analytically, depending on analytic context. Here, I code this for its RA as an RP-RR, which is to make clear that it functions more than a PC or CC. Elsewhere, when analyzing relatively referential versus relatively phatic chains, I treat this as phatic because it does not add to the chain of referential knowledge.

^{vii} I'm able to see this and analytically say this because I combined micro-analysis with a more longitudinal study across multiple activities, and thus am able to interactively trace Alvin's learning. This is an important methodological insight into demonstrating how to utilize IA over multiple activities to evidence that learning is happening.

^{viii} Data findings here evidenced interactional use of humor, such as sarcasm or silliness, that disrupted the projectability and progressivity of certain participation frameworks in motion, affording new arrangements of participation frameworks, new possible frames, and emergent affordances for RA.

^{ix} While at times my theoretical-analytic lens may be off (such as due to cultural biases in my habits of thinking), I do speculate that indeed there are varying degrees to which pre-reflective experiences get transformed into RA. To reveal the side of experience that shades toward pre-reflective experience that has not been transformed into reflective experience, I operationalize "pre-reflective" as a qualifier of certain kinds of experiences, substrates, objects, and so on.

^x To illustrate how codes vary even within interactive chunks during a single activity, I will zoom in and discuss the code counts here. As a broader note, I do not typically do this because the coding scheme itself is somewhat tentative and not cross-checked by independent analysis thus lacking inter-rate reliability, and I hesitate counting frequencies at such a zoomed in level as a general practice. That said, the reason I choose to zoom in here and utilize some very basic numbers is to help illustrate the potential ways such a methodological approach may help

complement and triangulate findings should overall framework of this dissertation gain wider adoption.

^{xi} While I code this as a RP-RR dyad here, its function is more phatic (autonomic) than referential (intentional). As I have argued in Chapter 2, all communications are both phatic and referential (Žegarac and Clark, 1999), though one or the other aspect can be interactively foregrounded. I would add that this is also the case analytically, depending on analytic context. Here, I code this for its RA as an RP-RR, which is to make clear that it functions more than a PC or CC.

Elsewhere, when analyzing referential versus phatic chains, I treat this as phatic because it does not add to the chain of referential knowledge.

^{xii} I'm able to see this and analytically say this because I combined micro-analysis with a more longitudinal study across multiple activities, and thus am able to interactively trace Alvin's learning. This is an important methodological insight into demonstrating how to utilize IA over multiple activities to evidence that learning is happening.