Relational epistemologies: Impacts on knowledge and constructions of meaning and engagement in the "natural" world

Megan Bang
Assistant Professor,
Learning Sciences and Human Development
College of Education, University of Washington

This work is part of a large program of research that involve many many people.

This work is drawn from two papers:
Bang, M. Warren, B., Rosebery, A., & Medin. D (in press).
Desettling Expectations in Science Education.
Human Development.

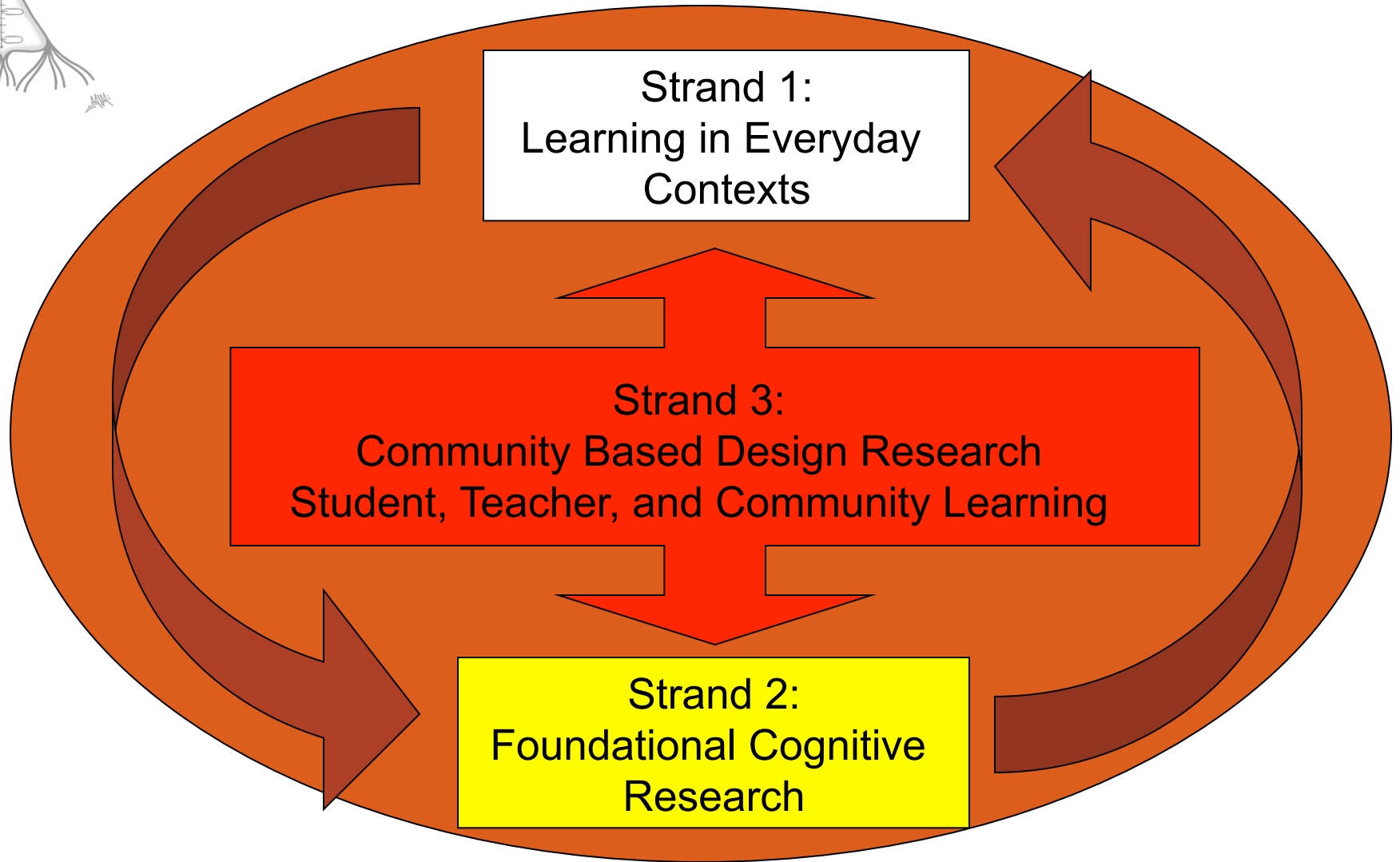Bang, M. (Submitted). Seeing epistemic labor in meaning-making:.

A view of relational epistemologies

The ways in which knowledge, its source, scope, and validity, knowledge organization, knowledge construction, and knowledge dissemination are rooted in the premise that "*everything is related, that is,* [everything is] *connected in dynamic, inter-active, and mutually reciprocal relationships*" (Cajete,2000).

Kawagley, 1996; Deloria,1999; Pierotti, 2011 Fixico, 2002; Yazzie-Burkhart, 2004; Waters, 2004; Vizenor, 1994; Turner, 2006; Richardson, 2000; Grande, 2004; Cordova, 2007

3 major strands of work exploring relational epistemologies

Strand 1:
Learning in Everyday Contexts

Strand 3:
Community Based Design Research
Student, Teacher, and Community Learning

Strand 2:
Foundational Cognitive Research

Communities involved in research

Urban inter-tribal Native community (Chicago)
- Founded on federal relocation policies during the 50's & 60's
- 32,000 Native people, with over 100 tribes represented in Chicago-land area
- High rates of poverty, health disparities, and low levels of academic achievement and institutional resources.

Rural Native community in Wisconsin (Menominee Nation)
- Tribal Schools, Public Schools, Tribal College, and Private College
- Primary source of employment is a logging company: received world recognition for its sustainability practices.

Rural non-Native community in Wisconsin (Shawano)
- "Border town"
- Primarily European American
- Middle Class & Working Poor

Non-Native Urban and suburban Chicago

20 Minute Parent/Child Dyad Diorama Play

- Conducted with 25 parent/child dyads across 3 communities.

- Child age range: 3-4

- Woodland setting diorama that included: bear, eagle, turtle, cow, zebra, deer, gorilla

- Differences in parent/child attentional habits and directives and their impacts on knowing (See Rogoff et. al, 2003; Correa-Chávez, M., et. al, 2005; Paradise, R., & Rogoff, B. (2009) for more info on attentional habits.)

View 1: Content focus

Eating relations: European American Dyad

- Parent: What is this?
- Child: An eagle.
- Parent: What do eagles eat?
- Child: Fish.
- Parent: And what do fish eat?
- Child: Worms.
- Parent: That's right! Good job.

Eagle

Predator/
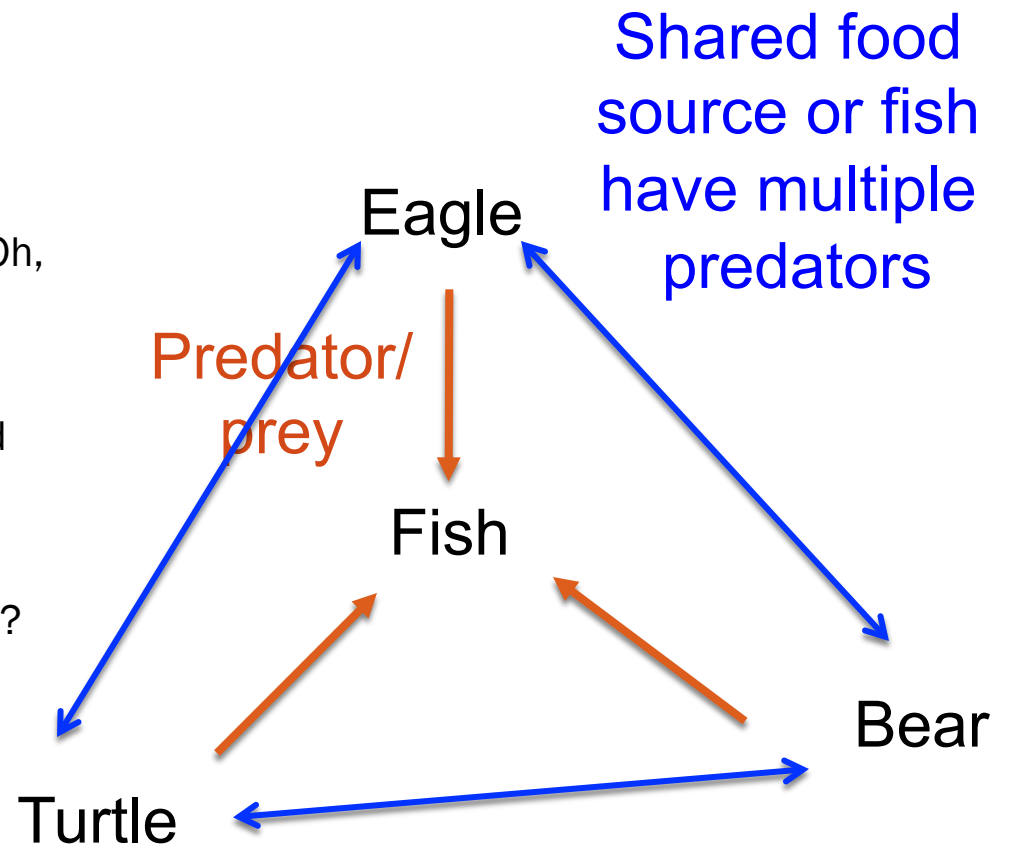prey

Fish

Worms
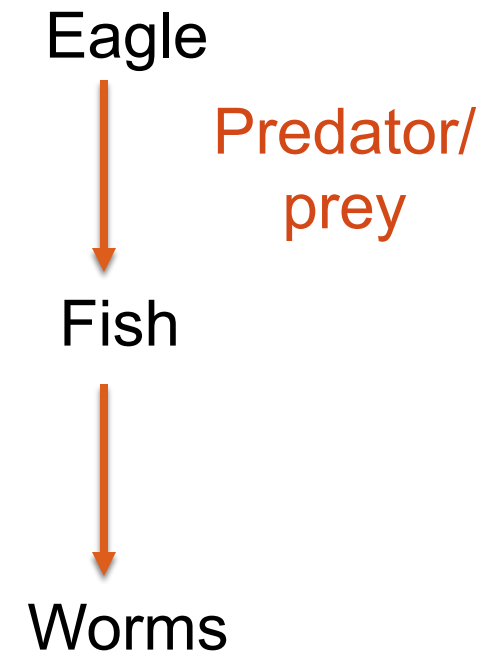
Food chain

Eating Relations: Native American Dyad

- **Parent:** Which one is it?
- **Child:** Migiizii.
- **Parent:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?
- **Child:** He's trying to find some fish.
- **Parent:** Some fish. You know who else could find some fish ?
- **Child:** What?
- **Parent:** Let's see who else eats fish in here?
- *Child: {picks up the bear}*
- *Parent:* The mukwa. What's this?
- **Child:** {picks up the turtle}
- **Parent:** Schiken. Who else I see we got. This one is fishing?
- *Child: {nods her head}*
- *Parent:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Eating Relations: Native American Dyad

- **Father:** Which one is it?
- Mia: Migiizii.
- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?
- Mia: He's trying to find some fish.
- **Father:** Some fish. You know who else could find some fish ?
- Mia: What?
- **Father:** Let's see who else eats fish in here?
- *Mia: {picks up the bear}*
- *Father:* The mukwa. What's this?
- Mia: [Unitelligble} {picks up the turtle}
- **Father:** Who else I see we got. This one is fishing?
- *Mia: {nods her head}*
- *Father:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Shared food source or fish have multiple predators

Eagle

Fish

Predator/ prey

Turtle

Bear

FOOD WEB

View 2: Explanatory focus

Differences in explanatory focus.

- **Father:** Which one is it?

- **Mia:** Migiizii.

- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?

- **Mia:** He's trying to find some fish.

- **Father:** Some fish. You know who else could find some fish ?

Internal state of the eagle singular in this specific context

Behavior of this eagle singular

Inferred causal link – child described behavior based on interpretation of internal state

Singular animal in specific ecological context

Differences in explanatory focus.

- Parent: What is this?
- Child: An eagle.
- Parent: What do eagles eat?
- Child: Fish.
- Parent: And what do fish eat?
- Child: Worms.
- Parent: That's right! Good job.

Shift from singular eagle to eagles as a taxonomic category

Reasoning continues in taxonomic categories: Fish and worms

Reasoning from singular kind to a property of the category

View 3: Attentional directives. And epistemic navigation?

Relational Epistemology?

- **Father:** Which one is it?
- **Mia:** Migiizii.
- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?
- **Mia:** He's trying to find some fish.
- **Father:** Some fish. You know who else could find some fish ?
- **Mia:** What?
- **Father:** Let's see who else eats fish in here?
- *Mia: {picks up the bear}*
- *Father:* The mukwa. What's this? {Pointing to the turtle}
- **Mia:** [Unitelligble} {picks up the turtle}
- **Father:** Who else I see we got. This one is fishing?
- *Mia: {nods her head}*
- *Father:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Relational Epistemology?

- **Father:** Which one is it?

- **Mia:** Migiizii.

- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?

- **Mia:** He's trying to find some fish.

- **Father:** Some fish. You know who else could find some fish ?

- **Mia:** What?

- **Father:** Let's see who else eats fish in here?

- *Mia: {picks up the bear}*

- *Father:* The mukwa. What's this? {Pointing to the turtle}

- **Mia:** [Unitelligble} {picks up the turtle}

- **Father:** Who else I see we got. This one is fishing?

- *Mia: {nods her head}*

- *Father:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Relational Epistemology?

- **Father:** Which one is it?
- **Mia:** Migiizii.
- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?
- **Mia:** He's trying to find some fish.
- **Father:** Some fish. You know who else could find some fish ?
- **Mia:** What?
- **Father:** Let's see who else eats fish in here?
- *Mia: {picks up the bear}*
- *Father:* The mukwa. What's this? {Pointing to the turtle}
- **Mia:** [Unitelligble} {picks up the turtle}
- **Father:** Who else I see we got. This one is fishing?
- *Mia: {nods her head}*
- *Father:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Relational Epistemology?

- **Father:** Which one is it?

- **Mia:** Migiizii.

- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?

- **Mia:** He's trying to find some fish.

- **Father:** Some fish. You know who else could find some fish ?

- **Mia:** What?

- **Father:** Let's see who else eats fish in here?

- *Mia: {picks up the bear}*

- *Father:* The mukwa. What's this? {Pointing to the turtle}

- **Mia:** [Unitelligble] {picks up the turtle}

- **Father:** Who else I see we got. This one is fishing?

- *Mia: {nods her head}*

- *Father:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Relational Epistemology?

- **Father:** Which one is it?
- **Mia:** Migiizii.
- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?
- **Mia:** He's trying to find some fish.
- **Father:** Some fish. You know who else could find some fish ?
- **Mia:** What?
- **Father:** Let's see who else eats fish in here?
- *Mia: {picks up the bear}*
- *Father:* The mukwa. What's this? {Pointing to the turtle}
- **Mia:** [Unitelligble] {picks up the turtle}
- **Father:** Who else I see we got. This one is fishing?
- *Mia: {nods her head}*
- *Father:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Relational Epistemology?

- **Father:** Which one is it?

- **Mia:** Migiizii.

- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?

- **Mia:** He's trying to find some fish.

- **Father:** Some fish. You know who else could find some fish ?

- **Mia:** What?

- **Father:** Let's see who else eats fish in here?

- *Mia: {picks up the bear}*

- *Father:* The mukwa. What's this? {Pointing to the turtle}

- **Mia:** [Unintelligible] {picks up the turtle}.

- **Father:** Who else I see we got. This one is fishing?

- *Mia: {nods her head}*

- *Father:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Relational Epistemology?

- **Father:** Which one is it?
- **Mia:** Migiizii.
- **Father:** Migiizii, oh! Let's see his [talons]. Oh, a cutie one. Is the migiizii hungry?
- **Mia:** He's trying to find some fish.
- **Father:** Some fish. You know who else could find some fish ?
- **Mia:** What?
- **Father:** Let's see who else eats fish in here?
- *Mia: {picks up the bear}*
- *Father:* The mukwa. What's this? {Pointing to the turtle}
- **Mia:** [Unintelligible] {picks up the turtle}.
- **Father:** Who else I see we got. This one is fishing?
- *Mia: {nods her head}*
- *Father:* Bezhik niizh, swe. Do you have anymore that eat fish in here?

Engaging Relational Epistemologies in Learning Environments

- "The relation between life forms and forms of life has become liquid, turbulent. One might even say that the relation of nature to culture is at sea...in marine microbiology, life is becoming unmoored from the boundaries of the organism into networks of connections...life is being redistributed into a fluid set of relations (Helmreich, 2009).

- What does all this mean for the form that life takes? … Marine microbiologists are clear that classifications are matters of framing. The form in "life forms" changes with scale and context…Many of their theoretical and classificatory conundrums are about how to link, as they phrase it, genomes to biomes. The question, how to think about the forms life might take depends on which properties are relevant to the unit of description in question and on how sociopolitical frames…condition these choices, even as they are themselves summoned forth by biological knowledge in a complicated cycle in which life forms and forms of life recursively inform one another. (Helmreich, 2011, p. 687)

Chicago Program: Living in Relationships

- Based on prairie and forest ecology

- Anchored in students developing relationships with medicinal plants: Remaking Relatives

- Three Units
  - Unit 1: Knowing, Seeing and Representing Place
  - Unit 2: Dynamic Relationships in Place: Ecosystems
  - Unit 3: Living Sustainable Relationships: Climate, Technology, and Policy

- Result in a curricula and a set of design principles.

Assessing the rivers health

Shelly (teacher): "So one of the reasons that this is important is that we've harvested medicine from this place, right? And this river feeds the plants and animal life that's here. So we want to make sure that we're harvesting medicine when it's ready to be harvested. So in addition to finding out just basic health indicators, we also want to know the health of the system here."

Allan (teacher): "The plants that we use to heal ourselves are going to heal the earth before they're ready for us. So if we find out that this place is unhealthy, we're not going to want to use the plants here because they're not ready to be used for us, they still have to work on the earth first."

Walking the old river

- Jacks: "An oxbow is an old spot where the river used to be... Now rivers- rivers don't stay in one spot. They never were meant to stay in one spot. Rivers always moved around. They widen, they retract just like a heartbeat...the river itself, which is alive- it may be like- the river may be thinking that 'I'll go back to where I was before but this is where I'm needed right now.'"

Relational Epistemologies, Learning and the Design of Learning Environments

Dimensions that are critical to consider:

- Historical patterns of knowledge-power relations

- Assumptions trajectories of expertise and assumed assimilation into dominant knowledge paradigms

- Heterogeneity of learning.

- More specifically, in learning environments focused on subject matter typically thought about in the disciplines of biology and ecology, consider the ways in which forms of life and life forms are recursively constructing potential meanings and worlds.

Chi mii gwetch!

- This work is made possible by the efforts of more than 200 elders, adults, & young people in the Chicago inter-tribal community and the Menominee Nation community.
  - Especially the design teams and teachers in these two communities.
  - Douglas Medin, Cynthia Soto, Adam Kessel, Ananda Marin, Jasmine Alfonso, Lori Faber

- Funded by NSF – REESE & ISE GRANTS

- For more information contact: mbang3@uw.edu