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Responding to Dogs

> We and all animals with whom we share our time and space should be viewed as friends and partners in a joint venture where we enjoy an egalitarian give-and-take relationship.—Marc Bekoff (*Animals Matter* 164)
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> Go look at your dog. Go to him! Imagine his umwelt—and let him change your own. —Alexandra Horowitz (*Inside of a Dog* 198)

Dog lessons. March 17, 2004 — practically spring — but patches of snow still dotted the hills on the sides of the highway. The air cooled down as I ascended the Coquihalla Highway. The destination was the toll-booth where I would meet Valerie. I parked the car in the lot just before the booth and walked to join her. I brought a small fabric kennel along to put the pup in for our 90 minute return journey. I found Valerie and we exchanged greetings. I gave her cash and she handed me the black pup — the first one I ever held.

I didn't have a dog as a child. But when I was nine or ten years old, I became good friends with my brother's dog Sprinky. My brother Alex was 12 years older than me, was married, and had his own apartment. Soon after getting Sprinky, he moved away to New Zealand for work, and gave the dog to an elderly neighbor, Ms. Pettijon, who lived down the street from us. After school, I'd go get Sprinky, bring her home, and play with her in the yard. I grew to love Sprinky and she became my best friend. When Sprinky died of a brain tumor, probably caused by the flea collar she wore continuously, I didn't develop other friendships with dogs until much later. When I turned 41, I once again felt the need for dog companionship, to continue my growing-up.

The pup was bigger than I thought, but still only two or three pounds. He had no collar or jacket; his fine hair the only shelter between his body and the cold air. He would not be happy in the kennel I brought along, and would probably cry, Valerie said. He was used to being in close contact with her and would expect that of me. She handed me an old flannel shirt of hers, something familiar for him during his transition. We parted, and I began the drive back to Vancouver, the pup curled up on the shirt in my lap. I felt his body relax while he napped. A sense of trust. We stopped at a rest-stop along the

way and he wandered around, sniffing the grass. After doing his business, he allowed me to pick him up. I sensed his willingness. We continued home.

When Greg and I were deciding on a dog, we hadn't considered whether to adopt from a breeder or from a rescue facility.[1] The criteria were determined by my allergies and our limited outdoor space. We settled on a miniature schnoodle — a small schnauzer-poodle mix — because these non-shedding dogs produce less allergens than shedding dogs, and they grow to only 20 pounds. Our tiny Japanese garden could accommodate a small dog for house-training. The pup would need access to outdoors every 1.5-2 hours. The outdoor space needed to be large enough for a puppy to wander around and choose a spot. For walks, we relied on the park across the street and the rest of the neighborhood.

We found Valerie, a breeder a few hundred miles away who cared about her two dogs and their pups. She provided a pen in the back yard for the pups to spend time outdoors with their parents. In the evenings, she brought them inside for warmth and safety. Valerie sent pictures of the pups for us to decide which one we wanted to adopt. The pups were only five weeks old, still dependent on their mom. We may decide on a pup, but would have to wait another three weeks until they were weaned before we could adopt. One pup was black, with a little white star on his chest. He looked directly into the camera. He was the one.

Fig. 1. Tom at five weeks old. (Photo courtesy of Valerie Knutlie.)

This essay explores the canine-human relationship for lessons in more-than-human ethics developed from the lived experiences of play, companionship, work, creativity,

sleep, growth, and transformation shared over a lifetime. My experiences with dogs led to an understanding of the ethics of communication crucial to embodied encounters. Close physical proximity, living and working together, and communications expressed between us through touch, voice, facial expression, gesture, and movement, created a loving bond. Our experiences together transformed my view of the world, on what I chose to eat and wear, and how I chose to contribute to social change. The dogs included me in play, and I experimented in creative processes. These collective efforts inspired collaborative art-making. The compassionate encounters and the love that emerged provide a narration to support an exploration of more-than-human ethics.

The narrations in this essay include an investigation into communication ethics, informed by Val Plumwood, as ontological investigation into other animal communication modalities. My elaboration on communication ethics integrates thought on proto-ethics — as originally proposed by Jacques Derrida —, embodied encounters leading to appropriate respondings. I include research into evolutionary biology, neuroscience, cognitive ethology, and ethics of care to support the investigation. Evolutionary biology suggests that emotions and feelings experienced by humans and other animals provide social bonds. Ethics of care describes the role emotion and feeling has for developing respect and compassion for other beings, even across species. I propose that these material experiences are relational moments of meaning-making. My lived experiences with the dogs led to knowledge of canine expression and communication in forms of gesture, energy, touch, facial expression, and voice, and this knowledge generated better relations with the dogs and creative collaborative events. Cognitive ethology and biology methodologies described by Marc Bekoff, Alexandra Horowitz, and Gregory Berns support the development of knowledge through respectful applied methods. Biocentric anthropomorphism, first proposed by Bekoff, describes sensing and thinking about other animals who may experience the world differently. The philosophy of Derrida on *différance* informs this ethics of diversity.

Responding, as a key aspect of communication ethics, is explored in this essay through reflections on the processes of my art project, *EPIC_Tom* (2014-16), a performance and installation project carried out in collaboration with my two companion-working dogs, Tom and Sugi. This practical investigation includes an inquiry into representation, as experiments in imaging and sonifying canine expression. The project used technical methods of motion capture, animation, live algorithms, and granular synthesis to contribute to the imaging and sonifying stages. The project's processes that involved the dogs included applying communication ethics to avoid harms. Deep-listening, call and

response, improvisation, and musicking are methods applied in the production stages that provided means to work collaboratively with more-than-human others.

Early days. We returned that evening, and Greg and I fed the pup and played with him for a while. The reading we did suggested that a new puppy should not sleep with their human. We hoped the pup would accept the plywood pen that Greg constructed by the front door. It was furnished with newspaper, a blanket, and soft toys. I put the pup in the pen, and headed to bed. After a few minutes, he began to whine. Then, I heard little feet running down the hall to the bedroom. He came around to my side of the bed and reached up towards me. I picked him up. Greg got up and added another board to the fence surrounding the pen, making it higher. We put him back in. For hours we tried to ignore his cries. I felt terrible. His first night away from his mom, in a new home, and forced to be by himself. We hoped it would get easier. Finally, we all fell asleep.

The following night at bedtime, we put him back in the pen. He whined even louder than the previous night. After a few minutes, I heard a scratching sound and then little feet running down the hall. Despite his size, the pup had managed to climb the half-meter high fence. He sat on the floor beside the bed and looked up at me. I reached down, picked him up. I made a little space for him by my pillow. I covered him with a light blanket. He quickly fell asleep. I could hear his small rhythmic breathing. We were all much happier. The next day, we named him Tom after Thomas Bernhard — our favorite author at the time — and after Tom Sawyer. We sensed his critical attitude and adventurous spirit. Since then, he has slept on the bed every night.

In subsequent weeks, I kept Tom close. I even took him to class when I had to teach. "Pets" weren't allowed in the building, but I brought him along anyway. I had a puppy bag that looked like a satchel, which allowed him to be hidden from view. Once in the classroom, I'd set the bag on the work table and Tom would crawl out. The energy in the class transformed; the students became calm and happy. They liked having him around. He liked it, too. He would cuddle up on the laps of some students, or just rest on a blanket. At lunch and on breaks I'd take him outside to a nearby park. Sometimes along the way I'd visit the administrative assistants in the President's office. They'd stroke and admire him. He never barked or cried during the work day. He enjoyed being near me and interacting with other humans.

During his first year with us, his vitality expanded. He needed continuous physical and cognitive activity. If he was not satisfactorily engaged in walks or games, he'd take out his frustrations on objects, or on me. With his sharp baby teeth, he'd snap at the bottoms of my pants as I walked around the house. He'd attack pillows, socks, and shoes as

though they were prey animals. He'd pounce on them, bite them, and give them a quick shake. When I'd work in the garden he'd "help" by furiously digging holes around me. In the evening, when we'd let him out into the Japanese garden for a pee, he'd run tight circuits around it, dispelling any left-over pent-up energy. Because of his perpetual liveliness, he was always hungry. Sometimes after being fed, he'd sit and point with his nose at the kitchen counter, asking for more.[2] Tom clearly communicated that his cognitive and physical needs weren't being met.

Fig. 2. Tom as a pup catching a ball. (Photo by the author.)

In order to channel his energy, I developed skill-building play sessions. Some were beneficial to him, but others negatively affected his health. We attended puppy school, where I learned to ask him to come, sit, heel, and generally pay attention. At home, we taught him to *go see Greg*, or *go see Julie*. We taught him to get the mail, and pass the appropriate envelopes to Greg or myself. We used the requests *give this to Greg* or *give this to Julie*. He accommodated — mouth to hand. To this day, when he hears the letter-carrier put the mail through the mail-slot he'll run to retrieve it. The learning sessions

were carried out using positive reinforcement through verbal praise and food rewards. We would finish a lesson on a well-accomplished task; a technique to reinforce positive memories. We never used punishment for incorrect responses or behaviors. If he didn't respond to a request, we'd try a different approach, or just move on to a different task. If he used aggressive behavior toward us, such as biting or scratching, we'd give a *yelp* to let him know it was painful. Dogs use this technique among themselves in play sessions in order to communicate; the too aggressive dog will learn from the yelp and subsequently avoid repeating harm (Bekoff, "Wild Justice"). Tom loved the learning sessions. He would express his enjoyment by laughing. His laugh, like that of all dogs, is an infectious series of short breathy exhalations (Horowitz 103).

We developed jump and catch games to learn eye-mouth coordination and strength. Tom became expert at catching small bits of food tossed to him from the kitchen. He also learned to catch balls in mid-air, thrown to him from distances. He could do this for hours. He developed a keenness for chasing balls, sticks, and frisbees. His body took on a compact aerodynamic shape, with his back and head in a straight line, as he ran at top speed to intercept them. He'd use a similar shape to chase squirrels, despite my protests. Ball or frisbee chasing has been described as a form of prey response in dogs (Horowitz 287).

A jump game involved me holding a stick at waist level and Tom jumping and grabbing it. He was only as tall as my knee, so this was a considerable accomplishment. He concerned himself with grabbing the stick, not my hand. This repetitive action, and the intense ball chasing, took a toll on his back, and after some months we noticed changes in his movements.

Sometimes during a ball chase or jump session, Tom would abruptly stop. Panting, he'd look up at me with a worried expression on his face. In the morning, he'd hobble, one step at a time, up the stairs. If I tried to touch his back or hind legs, he'd growl and snap at my hand. He was reluctant to jump up onto the bed. Instead, he'd stand and wait for me to pick him up. I interpreted these changes in his movement as an expression of pain. We took him to the vet.

X-rays showed a smaller than usual space between one set of vertebrae in the middle of his back. The veterinary chiropractor suggested that he had a chronic muscle spasm due to stresses on that part of his back, created by repetitive intensive activities. Tightening the muscles around the spine would shorten the space between the vertebrae. He advised us not to play ball every day, and not to do any jumping for a while. He warned that dogs will chase at top speeds even if they're in pain, thereby exacerbating

the condition. We reduced the running and eliminated jumping. I combined this with gentle massage techniques learned from a canine masseuse. It took time for him to trust my touch. I learned that it was important to be consistent with the pressure and duration of touch, otherwise he'd bite at my hand and move away. If I did it correctly, he'd express his gratitude by licking my hand. If I stopped to soon, he would ask for more by reaching out to me with his front paw. His overall movements improved and he eventually stopped favoring his back and legs. He has since come to enjoy daily massages. Every morning, he sits at my feet and presents his back to me. He licks to show his appreciation and contentment.

Despite his small stature, Tom's athleticism resulted in a body weight of 22 pounds, heavier than any other miniature schnoodle we met. This meant he was now too heavy to bring to work hidden in a bag. We didn't like the idea of leaving him alone at home. He could only tolerate it for an hour or two before resorting to chewing rugs and shoes. Dogs can get bored and lonely if left by themselves while their humans are away at work (Horowitz 292; Coppinger & Coppinger 228). We tried a dog daycare for a while, but they demanded that he be kept up-to-date with vaccinations, including for dog influenza called kennel cough. I was skeptical of the benefits of these vaccinations, having learned that they can inadvertently cause harm.[3] We decided to get a second dog as a playmate and companion for Tom. Even though this would mean more work, the dogs could keep each other company when we were out.

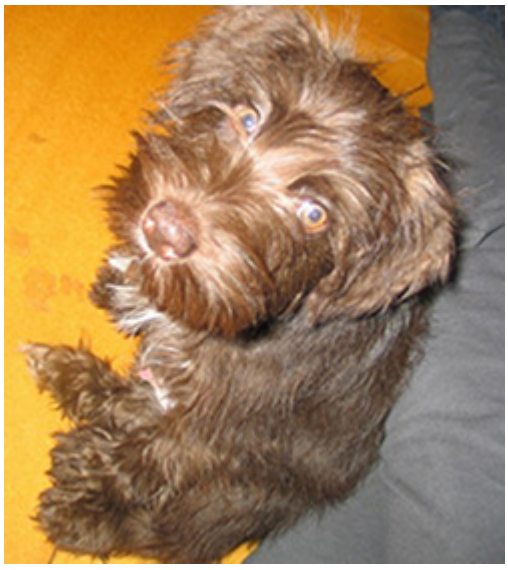

Fig. 3. Sugi as a pup. (Photo by the author.)

The new pup resembled Tom, but had a different character — he was less rambunctious, more thoughtful. Inspired by his red-brown fur and Zen demeanor, we named him Sugi after a type of Japanese cedar. Naively, we thought Tom would welcome Sugi to the household, but instead he protested. He'd growl at Sugi or ignore him. Sugi would playfully nip at Tom's legs and then leap under the sofa to escape his wrath. This would annoy Tom, who would bark and dive in after Sugi.

After about 2 weeks, Tom accepted Sugi. They played together and hung out. They'd curl up on the arm chair, or lie together by the fire. Like a big brother, Tom developed a protective attitude. He would deter Sugi from risky situations that Sugi would throw himself into. If Sugi saw a new dog at the playing field, he would charge at top speed towards the dog. This is not a good idea, because a charge can cause alarm in the other dog. Seeing Sugi do this, Tom would run after him. Being faster and larger, Tom could catch up to Sugi and shoulder-bump him just enough to slow down his charge. Tom's interception created a more polite approach towards an unfamiliar dog. I relayed this to our dog-walker Judy Lopes, and she confirmed that more knowledgable dogs will do this to teach a less experienced dog. Tom was expressing empathy for Sugi by shaping Sugi's awkward approach towards unfamiliar dogs; he was helping Sugi avoid potentially dangerous encounters.

We developed fun games to enjoy together. One was the *name-game*, in which I'd verbally ask each of them to retrieve a named toy from their basket: *Tom, where's the meteor*? Tom would growl as he poked around in the basket, choosing out the appropriate blue knobby ball. If Sugi had trouble remembering which item was the one I was asking for, he'd just grab the last toy that was handled and present it to me. Tom would get frustrated and vocalize a short forceful but whiney bark — *he knew the answer*. If asked, he'd quickly present the correct toy. During the game, if I spent too much time attending to Sugi, Tom would also protest by articulating three quick forceful barks. He communicated that my attention to Sugi was unfair.[4] In other contexts involving unfair allocation of rewards, attention, or praise, Tom would use this vocalization, or he would push himself between Sugi and myself. At the end of the name-game, after all the toys were retrieved, I'd ask them to put each item back in the basket. They'd grab each toy and hurriedly drop them over the rim of the basket. In their excitement, they'd sometimes miss the basket, the item bouncing outside its rim. Regardless, they'd sit and expect a reward for a job well done.

Sugi expressed himself differently from Tom. He had to work harder in social situations. When he approached dogs, they'd often get angry with him by growling or

snapping. He avoided being touched by other humans. Rather than being curious, Sugi was fearful of unfamiliar objects in the house. He'd react to loud or unfamiliar sounds by fleeing, crouching close to the ground with his tail between his legs, ears pulled flat against his head. Despite his fears and awkward communications with other dogs, Sugi was keen to learn new things. He showed enthusiasm for tasks that demanded focus.

Sugi especially liked hiking and scent-tracking in the woods of North Vancouver. In the forest, he never expressed fear. Off-leash, he'd boldly run ahead, but would not forget to stop and sniff things along the way. His fur camouflaged him amongst the trees and dirt trails. Sensing his comfort in this environment, we enrolled in a couple of scent-tracking classes. Sugi loved these exercises and would focus on finding the objects I would hide in the underbrush. His eyes would grow wide when I'd point at the ground and say *search*! He'd quickly sniff along the ground in the appropriate direction toward the item. When it was found, he'd point with his nose and sit, communicating the gesture for *found it*. I'd reward him with a treat. Later, I adapted this game for Sugi to find chanterelle mushrooms. He found this less interesting, but accommodated me. When asked to *find the mushroom*, he'd point to one, sit, and get a reward. Then, he'd trot away to find a more interesting odor. The scent-tracking skills created a lasting influence on Sugi's attention to the world; on our walks in the neighborhood he takes his time sniffing everything little thing along the way.[5] By observing Sugi's focused attention on the immediate world, he has taught me to slow down and to enjoy the moment.

Fig. 4. Tom and Sugi walking cooperatively together. (Photo by the author.)

Dogs like to walk off-leash at their own speed. This gives them the ability to stop to sniff as they are inclined (Horowitz 84-85). For our daily walks, Tom and Sugi have been taught to be responsible off-leash walkers. They stop at the corner and will not cross the road until I give the *OK*. They respond to nice walks by walking at my side if needed. Tom is more responsible off-leash, so sometimes I ask him to *help Sugi* by walking cooperatively. This involves them connected to each other by a short lead. During these walks, Tom takes charge, stopping at the street corner and waiting for my OK. Tom gets satisfaction from this task; Sugi enjoys walking at Tom's speed. It took years to develop this cooperative walking, but it has paid off. The dogs' ability to travel at their own speed and investigate the world is an important aspect of their autonomy.

The early experiences with Tom and Sugi were lessons for me on their intentions and emotions, and how they communicated these. The dogs developed understandings of my intentions, emotions, and communications, too. The experiences affected the depth of our relationship; not only did they become loving companions, but also working collaborators, participating in numerous projects carried out in front of cameras, sensors, and microphones, in my home studio, in motion capture, sound recording, and TV studios, in the urban streets, and in forest environments. Biologists propose that the human-canine social bond is unlike any other interspecies relationship. This is likely due to the shared communication modalities that have evolved over millennia (Coppinger and Coppinger; de Waal 114-117; Horowitz 42-46). The experiences have led to significant transformations in my life.

Dog communications. Zoö-archeological research proposes that dogs originated from wolves 15,000 years ago, during the mesolithic period (Coppinger and Coppinger 50-67). A view on dog evolution suggests that they adapted themselves to human habitation during this period; dog remains coincide historically with those of human settlements (ibid.). It is thought that groups of wolves began to take advantage of human refuse dumps, and for generations they built communities in relation to humans. The dogs lived close enough to get to know human behavior, but remained far enough away to maintain autonomy. This relationship is described as commensal.[6] Dogs were later taken into closer living quarters with humans, for companionship, work, and security relationships. Over time, the close proximity with humans created cognitive adaptations in canines that are different from their wolf ancestors. These adaptive traits include communicative abilities that are remarkably similar to humans. Dogs are good readers of human communications in order to get what they want, to anticipate future events, and to develop social bonds with their humans.

Dogs are keen observers of the human body. They pay attention to gestures, faces, and odors in order to read human intention and emotion. Dogs learn to understand hand gestures, such as pointing. For instance, they are able to interpret humans pointing at overturned cups with food treats inside, something wolves can't do (Horowitz, 176-177). Like humans, dogs will also point with their noses and bodies to indicate something they want. A cognition study designed a situation in which a dog witnessed a human hiding a treat beyond the dog's reach (*op. cit.*, 177-180). That human left the room and the dog's companion-human entered. The dog used attention-getting techniques towards his human — vocalizing and using body gestures, such as running between the human and where the treat was stashed, to direct his human's gaze towards the location. The dog used pointing techniques, and knew that this human would be able to retrieve the treat. The dog anticipated his human's mind.

Tom is a good pointer. When he's still hungry, he'll sit with his body clearly visible to me, aiming his nose at the kitchen counter. If he wants to be covered with a blanket he's sit within my range of sight and stare at the blanket.

Fig. 5. Sugi looking at me from an inverted viewpoint. (Photo by author.)

Dogs read human faces for expressions of emotions in the same way humans read other human faces. They use "left-face bias," looking leftward at the right side of the face being observed (Racca et al.). It is thought that dogs and humans look at the right side of a human face because it is on this side that emotion is most clearly expressed. This behavior is specific to the canine and human relationship; dogs do not show left-face

bias when looking at other dogs or at other animal faces. In the study that determined the left-face bias, the participating dogs showed even more communicative resourcefulness. They used their left-face bias on *photographs* of human faces shown to them on *computer screens*! Additionally, when shown inverted images of human faces, dogs continued to use left-face bias, still looking at the right side of the human face. Humans lose this ability when shown an upside-down face. Perhaps dogs can do this because their point of view often includes their looking from behind at our faces. Dogs can even look behind by tilting their heads back. They may use this technique to see and read our facial expressions when we stand, walk or sit behind them. I've seen Sugi look at me this way (see Fig. 5).

What about other animals' emotions and expressions? Evolutionary biology, cognitive ethology, and neuroscience[7] support the view that other animals have emotions, and that they are aware of them — they feel (Bekoff, *Animals Matter*; Bekoff, *Emotional Lives*; Berns; Horowitz). Darwin argued that other animals experience anger, happiness, sadness, disgust, fear, and surprise (Bekoff, *Emotional Lives* xviii-xx). Empathy, envy, and indignation were later identified also by evolutionary biologists (Walton; Damasio, *Descartes' Error*). It is suggested that emotions are adaptive traits that generate social bonds for survival fitness. Emotions such as happiness, disgust, empathy, and sadness help create cohesion among individuals and groups. Fear and surprise allow animals to respond quickly to potentially dangerous situations. Empathy in apes, canines, rats, whales and elephants assists with the formation of cooperation among individuals (Bekoff, *Emotional Lives*; de Waal; Poole). Empathy was expressed by Tom when he modified Sugi's approach to other dogs; Sugi and Tom work empathically when they walk cooperatively off-leash.

How well do humans read canine emotions? Dogs express their emotions — sadness, happiness, frustration, fear, empathy, contentment — through vocalizations, facial expressions, and gestures. They use a variety of kinds of vocalizations, including barks, whines, sighs, laughs, and growls. Experiments have looked at bark-types used in three different contexts: how a dog barks when a stranger rings the doorbell; how a dog barks when locked outside; and how he barks during play. When hearing a doorbell, a dog will use a low-pitched, loud, harsh-sounding bark; when a dog is locked outside, he'll use a single high-pitched bark, repeated with long pauses in-between; when a dog is playing, he'll use high-pitched frequent barks (Horowitz 108). Humans are able to read these successfully. Studies have determined that human listeners who listened to dog barks recorded in varying situations were able to identify accurately the bark's emotional expression, even when the dog is not their own (Pongrácz et al.).

Growling is also used by dogs to communicate. Soft growls are used to express playfulness; firm loud growls are sometimes used to correct the behavior of a younger dog. Whining is used when something is wanted or if the dog is in discomfort. Tom combines barking and whining when he's annoyed or desperately wants something, such as breakfast. Tom has developed the ability to modulate his voice, in a way similar to human speech. He has offered his abilities in the recording studio on numerous vocal recording sessions for collaborative projects.[8] Both Tom and Sugi let out a sigh of contentment when they are tucked in bed.

Dogs are also good listeners. They hear a broader range of sounds than humans. Humans can hear between 20 hertz and 20 kilohertz, while dogs can hear higher, up to 45 kilohertz, well beyond our detection. Dogs can hear the high-frequency hum from fluorescent lightbulbs, and the ultrasonic vibrations of termites. They pay attention to the frequency modulation of human voice, as when we use pitch-shifting to a higher-frequency at the end of an exciting question — *do you want to go for a walk*? Dogs can learn to understand human language to a degree, and they depend on hearing voice-modulation to fully understand the meaning (Horowitz 93-94). When asked something, dogs will use their ears and head to indicate they are listening. They point their ears forward and may tilt their heads. Some dogs are able to understand human language better than others. This is probably due to training. Tom knows many more words for toys, people, and locations than Sugi, because I spent hundreds of hours with him using these words when he was young.

Dogs use various gestural expressions to communicate that they do, or do not, understand human communications. These include using ears, mouth, and eyes in their facial expressions. Their ears may be the most expressive part of their faces; various ear positions can communicate ranges of emotion from fear to curiosity. Understanding canine ear positions, and their other gestures, depends on taking into account the context in which they are expressed. For instance, ears pulled back against the head can indicate submission, if the dog also looks away. The same ear position indicates fear, if the dog quickly retreats from the situation. Ears forward combined with an intent gaze indicates listening and attention; ears forward combined with a head-tilt indicates *I'm figuring something out*. Ear flickering from forward to back can indicate indecision or uncertainty (Coren 99).

Dogs combine ear and other facial movements. Ear and mouth movements are used together to express differing emotions. Ears back against the head with teeth bared expresses fearful-aggression; ears perked-up with teeth bared expresses dominant-

aggression (ibid.). Wide-open round eyes indicate excitement or anticipation; slightly closed relaxed eyes express calmness. Dogs' mouths express happiness or contentment when they are open in a relaxed way that shows some teeth; anger when the sides and front of the mouth are pulled tightly away to reveal all teeth. Dogs enact little licks at the tip of the mouth to express contentment, or to acknowledge *I understand what you said*.

Dogs are not timid about using their whole body to express how they feel. These include various tail positions, raised hackles, crouches, standing on tip-toe, rolling on their backs, play-bows, and paw-slaps. A wagging tail is a complex affair and doesn't necessarily indicate a happy dog. The context provided from the rest of the body is important for interpreting wagging. A dominant aggressive face that includes a high stiff wagging tail reinforces the expression of aggression. A dropped tail with a quickly wagging tip expresses submission. A tail relaxed, hanging down, or straight out the back indicates a neutral or calm state. Holding a tail still while the rest of the body is taut can indicate concentration, such as when Tom is anticipating a frisbee throw. Dogs tend to wag with a right-sided bias when they happily greet their humans or someone else of interest; dogs tend to wag to the left when greeting an unfamiliar dog (Horowitz 113). Hackles up on the dog's back indicates uncertainty or fear; combined with the appropriate mouth expression will reinforce a communication of aggression.

In play, dogs use their whole body for communicative expression. The gestures can be subtle and quick between the moving dogs. Many are only discernible to human observers through methods that include video recording and frame-by-frame examination to interpret what actually transpired (Bekoff, "Play Signals"; Horowitz). The play-bow is a body position in which the front end of the dog is on the ground while the rear is elevated. A short version of a play invitation is the paw-slap, in which the dog will slap both front paws or fore-legs on the ground briefly. During play, dogs will use nips, shoulder-blocks, hip-checks, and full body slaps against each other. They will continually remind their partners that these moves are enacted in play by following with a bow or paw-slap afterwards. Play between dogs can be intensely physical; they jump and tumble, roll over each other, and chase at top speeds, knocking against each other as they run. In play situations in which one dog is much larger than his playmate, the larger one will handicap his play to account for the potential risk to the smaller dog. When Tom was a year to three years old, he loved to play with big dogs in the nearby playing field. He was not afraid to play with great danes and pit-bull terriers, who would play rough and tumble, but always take into account Tom's relatively small size. A large Mexican rescue dog called Freida would humor young Tom by gently mouthing him while he jumped all over her.

Dogs use some of these play gestures with humans. A dog may give a play-bow or paw-slap to invite their human companion to play. Dogs will roll over on their backs in a submissive gesture to invite tickles and tummy rubs. Puppies learn to modify their play bite to a *soft mouth* when grabbing humans. In the early days, I helped Tom adapt his play by yelping if he bit me too hard. He'd stop for a moment to communicate that he understood, and then proceed with a softer mouth.

Dogs use other full-body gestures to communicate their emotions and needs to their humans. Tom likes to sit on my feet when he's waiting for me to get up to do something for him. He'll also do this when he feels insecure, such as when he sees me packing to go out of town. Sometimes when I'm sitting on the couch, Tom will come and gently lean against me — *I'm with you*. Sugi will poke my right calf with his nose when we're standing at a crosswalk waiting for the light to change, or when he's following me around the house as I get ready to take them for a walk — *move along*. Recently, Sugi started coming to me to express his fear when he hears a frightful sound. He'll sit near me and use his paw to gesture that he wants to be picked up. I'll pick him up and gently stroke his back and kiss his cheek, whispering reassuring words. After a few minutes his body will stop shaking and he'll calm down.

Emotions of canines and humans are expressed through gesture, body, face and vocalizations, but they are also communicated on a more subtle level. Neuroscience has examined the material nature of emotions in terms of brain activity in relational contexts. Emotions and intentions from one individual is communicated as empathy experience toward others, even across species. These sensings have been discussed as involving mirror neurons and spindle cells. While the findings from these studies have advanced empathy studies, it is important to acknowledge that the majority of them were carried out using stressful and harmful techniques on captive animals. Mirror neuron activity across species is a field of research closely being watched by biologists and cognitive ethologists because it indicates interspecies empathic responses. Mirror neuron activity between individuals, even across species, can be interpreted as involving empathy — *felt* communications across differing bodies.

I learned to understand the dogs' gestures as expressions of their emotions and intentions, but I also felt them. While playing, Tom communicated his happiness by laughing. When I heard this from Tom as a pup, I was not fully aware that his breathy expression was a laugh, but I sensed his happiness and it was contagious — I laughed, too. Sugi communicated fear using his full body posture, the position of his tail and

ears, and sometimes full body shaking. His body clearly indicated his fearfulness and I felt his fear.

Biologist Gregory Berns recently conducted fMRI research with dogs to examine what dogs were feeling when they saw human gestures, and smelled the scent of their companion humans (Berns). The research experimented with whether dogs understood human gestures as modes of communication, and whether dogs felt good about these communications. This research involved training methods using food rewards for the research dogs to become familiar with the fMRI environment. Methods were developed to respect the participating dogs' autonomy. (This key contribution to ethics of care is elaborated on below.) The dogs were taught hand gestures from the researchers as communicative modalities. They developed two hand signals. One communicated that *a hotdog will be given to you in the next 15 seconds*; the other that *a hotdog will not be given to you*. The researchers recorded the dogs' brain responses to the hand signals while they were in the fMRI scanner. The intention was to document, via the fMRI scans, the dogs' abilities to anticipate positive potentials. The scans showed that there was significant activity in the caudate region of the brain when the researchers gestured about giving the hotdog, and no significant activity when the researchers gestured that they would not give a hotdog. The caudate region in humans is associated with the expectation of something good. The scans indicated that the dogs understood the researchers' gestures — they *anticipated something good*.

Other unexpected data showed on the scans. As with the research on macaque monkeys, the dogs' premotor areas were active when they watched the hand gestures. When the human researchers gestured, the dogs' mirror neurons became active. Berns argues that the dogs were interpreting human hand gestures in relation to their own bodies. In other words, dogs interpret the communicative hand gestures that humans make through an understanding of the relationship between the human body and their own. They map the human gesture onto their own body — hand to paw. This indicates empathy from the dogs towards the humans.

Berns's research also yielded information about the dogs' responses to their companion humans. They used a test in which the dogs' brains where scanned when they smelled the scent of their human companions, without those humans being present. The researchers presented to the dogs pieces of material that had been previously rubbed with the scent of their companion human. The fMRI scans of the dogs showed greater brain activity when they sniffed the scent of their companion humans than when they sniffed the scent from unknown humans. The inferior temporal lobe — an area

associated with memory — was active in addition to the caudate area. Berns suggests that the dogs *feel good* about the familiar scent of their human — perhaps canine love.

Dogs use other sense-perceptions on a similarly subtle level. Animals, including humans, emit odors associated with their psychological states. Dogs, like rats, can detect emotion from airborne particles — pheromones — released through glands and the skin (Horowitz 80), produced in response to situations that cause alarm, fear, happiness, and comfort. It is likely that dogs can detect these hormonal emissions to sense their humans' emotional states, even without looking at their faces. To study how dogs respond to human emotional states on a chemical level, research has looked at the cortisol levels in dogs produced in response to stressful vs. playful situations with humans. Cortisol, a hormone linked to stress, is elevated in dogs after playing games that involve human voice commands (Jones and Josephs). They have lower cortisol levels when engaged in free-form play with their humans. During dog agility trials, when their male human companions have elevated testosterone — the hormone associated with dominance and aggression — before the trials, the dogs will have higher cortisol levels at the end of the trials if the team lost (ibid.).

Communication ethics. The ability to read vocalizations, face, and body gestures for intention and emotion across species potentiates a shared space of meaning towards social cohesion for relational flourishing. These communication modalities must take into consideration *difference* in cognition and expression. In this section, I will detail aspects of communication ethics with respect to difference. The examination includes a critique of anthropocentric methodologies that have historically led to the loss of autonomy for other animals, and the suffering and ecological degradation that this creates. My argument for communication ethics is informed by ethics of care, ecofeminism, philosophy, and respectful methodologies in neuroscience, cognitive ethology, and evolutionary biology. Communication ethics calls for knowledge development through an ethics of response to free-living beings communicating on their terms. This ontological approach provides understanding of the diversity of other beings' lives. In relation to this exploration, the last portion of the essay develops an expansion on representations of other beings' communication modalities. Art processes are a good place to explore representation because they can experiment with how these forms can influence thought. This aesthetic exploration is detailed in reflections on the processes collaboratively carried out with the dogs in the production of our art project entitled *EPIC_Tom*. The project used methods offered by advanced technologies, such as motion capture and sound recording, to detail the gestural and vocal communications of Tom. New media art forms — computational animation, granular synthesis, and

audio-visual performance — provided means to represent Tom's communicated emotions and intentions.

Communication ethics is informed by methodologies from naturalist studies, cognitive ethology, and biology that use observational techniques on free-living animals that respect their autonomy. Berns has recently expanded on this methodology by developing processes to allow for volitional participation of canines in the fMRI studies. The methods include developing safe testing situations, and step-by-step sessions with the dogs' to gain their trust and willingness to participate (Berns, et al.). Berns' team built prototypes of the fMRI machine that the dogs would learn to enter on their own terms. The dogs would willingly position their head on a custom built head support. The dogs who participated were rewarded verbally and with food treats when they held their head still. Sound trials were used to replicate the loudness of the fMRI environment. Realizing the hearing sensitivity of the dogs, the research team created a set of canine ear protectors to shield the dogs from the noisy environment. Berns stressed that the dogs were able to leave the testing stages at any time. They were never restrained or forced to do things they did not want to do. The evaluation of the dogs' stress was monitored, and the researchers watched their bodies and gestures to see what the dogs communicated in each stage. Some dogs exhibited an unwillingness, and these did not participate further in the research. Some dogs enjoyed the challenges, and would become excited when they began their research day. Berns's methods include respect for canine-human bonds; at the end of each day, the dogs returned home to their human companions.

Berns's research with dogs included creating ethical standards for their participation based on the standards designed for human participation in university research. Research involving humans typically adheres to strict ethical guidelines, including respect for participants' autonomy. For example, in Canadian universities, respect for autonomy is a "Core Principle," defined in the *Tri-Council Policy Statement*: "Respect for Persons incorporates the dual moral obligations to respect autonomy and to protect those with developing, impaired or diminished autonomy. Autonomy includes the ability to deliberate about a decision and to act based on that deliberation" (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, Social Sciences and Humanities Research Council of Canada, 8). Berns applied the ethics of human autonomy demanded by his university to the canine participants taking part in his studies. He included respect for canine participants' deliberations on the situations proposed to them, and respect for their willingness or unwillingness to participate in these situations. If a dog demonstrated an unwillingness, communicated

by a refusal to enter the device, or by pulling away, Berns ended the session with the dog, or modified his approach.

Epistemological investigation that incorporates ethics of care is a compassionate methodology that stands in contrast to normative harmful methodologies involving other animals resulting in the diminishment of their autonomy — such as in lab spaces, cages, and zoos used for conducting medical, biological, and cognitive research. Incorporating ethics of care in terms of communication ethics is proposed by Val Plumwood, who argues for "studying-up" on the communicative modalities of other animals by learning their communications, *on their terms*. She proposed looking at other-than-human modes of communication — gestural, sonic, pheromone, scent, and magnetic forms (Plumwood). By examining difference with regard to other animals' communications and cultures respect for diversity, and simultaneously a sense of humility, is generated.

Some biologists and cognitive ethologists have developed novel methods that afford investigation using respectful means, which simultaneously reveal the limitations of human perceptual and cognitive capacity. By recognizing the strangeness of their communications — that they may not be understood by humans — a sense of humility is brought to bear. This humility can be seen as a counteraction of anthropocentrism. I am expanding this thought to propose that attention to the diversity of communications, within and across animal cultures and habitats, is ecological; it is attending to communicating *in relation*. This complexity of communications happens even though we humans may not be able to discern it.

Canines contribute to this expansion of respect for communication through their scent-perception. They distribute, and read, scent-markings to communicate with each other. Dog urine has chemicals that distinguish the marker's sex, sexual readiness and social confidence. These markers provide qualitative evaluations for dogs to identify each other as individuals. Dogs also leave identity markers in their feces, that include secretions from glands near the anus. They release these involuntarily when afraid or alarmed. Canines can also leave scent-markers from glands in their paws and cheeks when they scratch or rub on the ground. Dogs will sniff these markings in order to receive information on who was previously there.

Sniffing is a complex activity that includes the ability to refresh continually the intake of airborne particles. Muscles in the nostrils draw air in, including the airborne particles of a scent, and simultaneously displace air already in the nose (Settles et al.). This old air is

either moved further into the nose cavity, or expelled via side-slits in the nostrils. The simultaneous inhalation and old-air displacement creates air turbulence that helps pull in the new air and particles. When air is pulled deeper into the nose, skin tissue lined with tiny receptor sites sense the odor particles. Human noses have six million of these receptor sites; dog noses have *three hundred million*. In addition to the greater number of receptors, dogs have more genes in the olfactory cells, more olfactory cells, and they have more direct connections from the receptors to olfactory bulbs. This allows dogs to have more immediate perception of their environment, in comparison to human visual perception; the canine scent system has a shorter route to the brain than the human visual system.

Canine scent perception is assisted by the vomeronasal organ that sits above the mouth in the nose, and has many more receptor sites for odors (Adams and Wiekamp). Other animals, including humans, also have this organ. Lizards use it when they lick the air to bring airborne molecules into their mouth, where they are shuttled to the vomeronasal organ.[9] Dogs make use of the detailed scent analysis by the vomeronasal organ by licking and eating substances, including urine and feces that contain pheromone particles. The combination of more receptor cells, detailed genetic coding, and shorter neurological connections affords dogs an estimated one million times more sensitivity to scent than humans (Horowitz 71-73). With this ability, trained dogs can detect a teaspoon of sugar in one million gallons of water (*ibid.,* 72), and they can detect disease in humans. Dogs can smell the volatile organic disease-maker particles diffused in the human blood stream and excreted as urine or as exhaled breath, at a concentration of 0.001 parts per million (Waggoner et al.). Dogs trained to detect cancer markers are best able to do so from exhaled human breath. They can detect cancer with up to 99% accuracy depending on the type of cancer (Moser and McCulloch).

A rumination on canine scent-perception provides thought on dogs' relationship to time. Dogs can detect how odor dissipates over time and space, such as the scent from a series of footprints along a path. They can tell which way a person went from the character of the odor's dissipation — a detection of an other's past movements. Dogs can also smell the future. Other beings who are approaching, but out of sight, are detectable. This allows dogs to anticipate what is to come. I have seen Sugi do this. A few years ago while at an outdoor farmers' market, Sugi pointed his nose west, and excitedly sniffed the air and pulled on the leash. A few moments later, from that direction, Judy — our dog-walker — appeared. Sugi greeted her with jumps of joy and excited barking. Sugi loves to meet familiar people this way in unexpected situations. Sugi was not able to see Judy because of the throngs of people between them, but he did catch her scent and anticipate her.

The knowledge of other beings' communication modalities presents a few ethical considerations. First, the reality that other beings' communication modalities are so strangely different from those of humans demands a rumination on humility. In some of the research examples, direct human perception about other animals' communication capacities was found to be too limited to provide knowledge on their complexity — with chickadees' (Ficken and Popp), canids' (Bekoff, "Play signals"), and prairie dogs' (Slobodchikoff), for instance. The research relied on technologies that revealed details about the communications that the researchers would otherwise not have been able to determine. These methods revealed aspects of the other animals' communications, and simultaneously revealed the limitations of humans. This dual revealing — of complexity in others and limitations in ourselves — demands a critical look at assumptions that have historically been at the core of anthropocentric views. What we now know about some animals' communications require a reconsideration of how we think of them; we can no longer make limiting assumptions about other animals just because we humans are too limited to understand them. Further, the realization that humans may not be able to perceive aspects of the diversity and complexity of others' communications suggests the possibility that the communications of others are probably much more complex and well-developed than we currently know. This is a humbling thought. It suggests that other animals are more consciously active agents in the world than humans have historical allowed.

Second, when the knowledge about other beings' communication modalities is examined from a biocentric point of view, it becomes clear that the belief in human exceptionalism with regard to language is unreflexive. All beings are part of social systems that involve necessary exchanges of information with others in their communities. These exchanges create meaning that assists with social coherence and survival. They do this by communicating with others about themselves and about the world around them, using adaptive communication systems. Each species, and even specific communities of individuals in distinct locales — like with the prairie dogs — have their own physical and cultural traits developed as communication modalities that have allowed them to flourish. Their communicative modalities are, evolutionarily speaking, the most appropriate ones for them; they are no less, or more, valuable than those of humans. Looked at from these biocentric and evolutionary viewpoints, human exceptionalism with regard to language has no basis as a means to evaluate other beings. It does not take into account that each species's language has been adapted in ways that are intrinsically valuable for them — cultural and social expressions essential for those specific beings.

With these points in mind, I argue that we need to expand the way we sense, feel, and think about other beings' communications. This expansion can be had through examining interspecies communications for their ethical and ecological potentials. We may expand our sensing and thinking about other beings through the potentials offered as *shared* communications in proximal relations. An example was provided by Sugi with Judy and myself, who together shared an interspecies communicative event. Sugi used his species-specific communication modalities to anticipate Judy's approach; he pointed Judy's whereabouts to me. Upon Judy's arrival, he communicated how he felt about Judy. My ability to read the complexity of communications offered by Sugi was based on knowledge gained through lived physical experiences with him; it was enhanced by being physically present and paying attention to Sugi in that moment. This physical experience using attention led to my understanding of his communication of joy and love for Judy.

I am proposing communication ethics as a means to advance understanding and compassion for other animals. Communication ethics includes sensing and feeling the materiality of the embodied event: subtle communications that happen through sensing our own affective moment, and what is happening for the other. Communication ethics pays attention to more-than-human communicative modes, such as gesture, and looks to relations between singular beings across species. Communication ethics includes an acceptance of indeterminacy for the sake of expanding loving regard and ecological flourishing.

Fig. 6. Sugi staring at me, attempting to communicate through thought alone. (Photo by the author.)

A reflection on the development of communications between the dogs and myself points to how it contributed to improved respect and love for them as individuals. Some of our early communications failed because learning to respond appropriately was an incremental affair. Additionally, each dog expressed his individual needs and desires in specific ways. Responding appropriately included adapting communications with each dog; what worked with Tom did not necessarily work with Sugi. Early on, I could recognize Tom's requests and expressions by getting to know his gestures, pointing and vocalizing. I had more difficulty understanding Sugi. Sometimes he would just sit and stare at me — maybe he thought I could read his mind (see Fig. 6). But Sugi taught me to be open to unexpected communications, and the excitement and love that accompanies these.

Transformation through embodied relations. Being in proximity, sensing the dogs' communications in our day to day experiences expanded my respect for other animals. As I got to know the dogs in those early days, I began to consider that other animals must have similarly rich individual ways of being. Free-living animals must have unique histories that inform their worldly projects; animals in industries must have severe and lethal realities imposed on them. I became interested in how animal lives are affected by industries: mice and rats in labs, cows and goats in dairy industries, pigs, lambs, chickens, cows and steers in meat industries, sheep in wool fabrication, ducks and geese in down production, bees in mass agriculture, horses and calves in rodeos, and countless animals in zoos and aquariums. Awareness of their suffering, coupled with the understandings brought about through relationships with Tom and Sugi, compelled me to adopt vegan ethics.

Views that accept the domination of other animals, are interconnected with the ideology of carnism, practiced in cultures that promote the construction of human identity based on the domination of other animals, carried out through meat-eating, dairy-consumption, and hide-wearing. The interdependence of domination and carnism is theorized in what Weitzenfeld and Joy call the "3 Ns" — normal, natural, necessary (Weitzenfeld and Joy 23). Forms of dominance, such as practiced in meat-eating, in rodeos and zoos, are widely accepted as normal. The ideology of carnism also details a *naturalized speciesism* by defining which animals are edible and which are not — in Western cultures cows are edible and dogs are not.

The normalization of meat-eating has been reinforced by false information on what is natural and necessary with regards to food. Until recently, meat-eating was promoted as a necessity, but nutritional research has disproved this belief. More widespread

discourse on this research is contributing towards its de-naturalization. The recent growing acceptance of vegetarianism and veganism within Western cultures attests to the potential to de-normalize domination of other animals. De-normalizing carnism in contemporary cultures can be informed by comparisons with other age-old cultures that have practiced compassionate relations with other beings, and have provided healthy lifestyles. Jain and some Buddhist practices include abstinence from eating animals, and care for life in all its forms.

Many ecofeminist scholars propose veganism as a means for everyday action to counteract the mistreatment of animals. Vegan ethics includes the adoption of awareness of the continued abuses in meat production industries that brings unfathomable suffering to individuals, and causes ecological devastation. Every year, *56 billion* animals are killed for the food industry (excluding the fishing industry). These industries employ inhumane techniques on animals confined under horrific conditions. The chicken industry uses hot-wire debeaking techniques for all chicks. Day-old male chicks are gassed or minced because they are considered useless to the industry. Hens are crammed in wire battery cages used for egg-laying, kept alive until they decrease their output. Free-range chickens are slightly better off, but they too suffer overcrowding. They are kept in large barns without natural light, and are slaughtered after 1 to 2 years. Dairy cows live only as long as they are able to produce milk, normally 5 years. Many cows suffer mastitis from overly full utters, and lameness from standing on concrete floors. They are subject to forced impregnation each year in order to maintain constant milk production. Their calves are taken away shortly after birth; the females raised into the dairy industry, the males killed or raised for the veal industry in small pens for months until they are killed. Female pigs suffer gestation crates, pinned down on their sides while suckling their babies who are removed after a few weeks.

In 2011, the Food and Agriculture Organization estimated that, internationally, commercial fisheries caught about 100 million tons of fish for that year — an estimated 157 billion individual fishes.[10] Recreational fisheries catch 47 billion fishes per year, with 36 percent killed, the remainder returned to the water (Balcombe 7). In ocean industries, fish are subject to suffering in the fishing processes. Once caught and brought onto the ship, fish die from suffocation, being crushed to death by the weight of the netted catch, or by being frozen alive in the boat's refrigeration units. The fishing industry also causes suffering and ecological devastation through by-catch — un-targeted fish and other animals caught by nets and lines. By-catch can include sea birds, sea turtles, sharks, dolphins, whales, and un-targeted fish such as halibut, flounder, cod, and others. By-catch results in the death of billions of pounds of marine animals every year.

Some studies estimate that the amount of global by-catch consists of *40 percent* of fish caught — 63 billion pounds per year (Keledjian et al).

Vegan practice not only rejects meat, dairy, clothing, fishing, and lab-testing industries for the animal suffering it creates, but also rejects large-scale agricultural practices for their ecologically detrimental outcomes. In 2012, the United Nations Environmental Programme released information on the ecological effects of the meat industry.[11] The livestock industry is among the top two leading contributors to climate change. That determination includes ecological stresses caused by the meat industry in the forms of deforestation, water use, fodder crops, fertilizer pollutants, as well as methane and nitrous oxide emissions from feedlots. Some "sustainable" industries argue for free-range practices. However, these are not viable ecological solutions, because they require increased land-use, resulting in vast areas of deforestation (Nibert 233-247).

Fishing industries have significant detrimental effects on ecologies. These include impacts on the species populations killed; the destruction of species inadvertently caught as by-catch; the discards from by-catch that increases scavenger species (Garcia); fishing gear losses that subsequently harm marine life and environments (ibid.); fish-farm industries that increase pathogens for wild fish (Morton); shrimp-farm industries that reduce lowlands, marshes and mangroves of Asian coastal areas (Páez-Osuna), producing waste that causes eutrophication — plant and algae blooms that decrease oxygen, leading to the death of other marine life.

By rejecting these forms of violence, vegan practice can contribute a compassionate and ecological response towards other animals. However, veganism should not be seen as a means to achieve a "good conscience" (Cavalieri 62). What is needed is further examination into other normalized forms of violence — both physical and symbolic. For example, vegan shoes and bags made of vinyl rely on oil extraction, thereby causing harm to ecosystems and wild-living animals. Forms of violence towards animals are also enacted in how they are represented in cultural forms — zoos, movies, animations, nature programs, books, newspapers, magazines, social media venues and advertising. These cultural products often represent other animals under normalized systems of domination, and therefore they can re-inscribe detrimental thinking. Images of cows in pastoral fields, as represented in dairy advertisements, portray an idyllic environment far removed from the hard reality of feedlots. Not only do cultural forms falsely represent reality, but real animals are often used in the production of these representations.

Communication ethics must include a critical examination into these cultural forms of domination, and how they serve to reinforce detrimental views about other beings. For the purposes of this essay, I will not provide a detailed critique of these popularized forms; representation in popular culture, such as in entertainment is been well-examined by recent cultural theorists (Berger; Burt; Sorenson). Instead, the following section will explore how compassionate forms of representation can be generated by methodologies from ethics of care. More compassionate cultural practices can provide sensitive representations of other animals that can in-turn change minds. For the remainder of this essay, I will narrate the processes of one of my art projects carried out in collaboration with the dogs; a project that aims for a critical representation of canine-being, and the wonder experienced in relation.

EPIC_Tom. In 2007, three years into my companionship with the dogs, I began a new body of work called *Animal Lover*. This work began as collaboration with the dogs, and has since expanded to include work with salmon, crows, trees, forests, and other humans. At the core of this interspecies practice is an incorporation of ethics of care as an investigation into the interconnection between ethics and aesthetics. The projects investigate communication, expression, and creativity of more-than-human being, to explore seeing, listening, and responding, for relational and ecological potential. In this section, I will detail the processes of one of these projects, *EPIC_Tom*, that experiments with communication ethics and canines. For this project, I was interested in exploring how canines use gesture and vocals to communicate. By focusing on canine states of being, I imagined this exploration could provide transformative potential in cultural forms; an expanded view on canines through representing aspects of their expression. For *EPIC_Tom*, I proposed to investigate these communications as creative content generated by the dogs. This investigation required the development of studio methods to record the dogs' communications as production material. What processes needed to be in place in order to do this respectfully?

Interspecies collaborative art methods may include embodied relations with other beings in close proximity. These situations are proto-ethical, in that they present opportunities for ethical responding and improved relating. However, the embodied participation of animals also presents risks in terms of potential harm for those animals involved. How the other animal is treated during the processes has consequences for the animal, for the artist, and for the representations generated for public reception in the final form of the artwork. In order to enact responsive processes in interspecies art-making, three interconnected questions arise. What methods are needed to enact respectful processes for the animals involved? How may these respectful processes be evidenced in the artwork in order to provide potentials for improved ethics by viewing

publics? How may the other animals' creative contributions be carefully represented in the artwork, thereby expanding on representational ethics for cultural forms? The following narration on art production stages for *EPIC_Tom* attends to each of these questions by folding ethics of care approaches into the studio processes.

As a way to investigate the dogs' full-body communications, I planned a series of sessions in a motion capture (mocap) studio to record data of the dogs' gestures and movements. Motion capture allows for movement to be recorded in three dimensions through cameras surrounding the studio space that read marked points on the moving body. The mocap data accumulated from a session may be used in software to model a moving virtual figure. I anticipated that mocap data from the dogs' movements could be used to create animations of the dogs, enacting specific gestures and motions as representations of canine expression. Potentially, these representations could contribute to sensing canine communications for viewers/listeners experiencing the final project.

In order to conduct this investigation, I had to test the dogs' willingness to participate in the mocap sessions. To gain their interest, I used knowledge generated from previous collaborations with them in similar working situations. For example, in projects carried out between 2007-2011.[12] I had developed an evaluative process that involved presenting situations to the dogs and paying attention to their responses. This allowed a project's production stages to move forward using successful situations, or to modify failed ones. In these previous working encounters, I was careful to provide safe and fun working conditions. When the dogs responded with boredom or reluctance I did not react with negative feedback, but either modified or discarded the approach.

When presenting a situation to the dogs, I displayed a calm and confident mood, and used hand gestures, facial expression, and vocal language. For instance, if I wanted to video-record Tom playing with a ball, I'd set up the camera, position the ball in the camera's view, and vocally ask Tom to go to the ball, indicating its direction with my eyes and pointing finger. Tom would communicate his understanding by moving towards the location and grabbing the ball with his mouth. Positive feedback was used with every request that was followed through with a communication of understanding. During my less successful communications, the dogs displayed boredom or indifference by communicating that their attention was directed elsewhere, such as in listening for sounds outside, sniffing the floor, or generally not paying attention. Refusing to participate can be more overtly communicated by full body movements away from the situation. As with Berns's experiments with dogs in the fMRI environment, Tom's and

Sugi's autonomy was respected, in that they could withdraw from the situation at any time.

In these situations, the responses from the dogs may be more nuanced. So attention needed to be paid to how they communicate these more subtle cues. For instance, the dogs communicated uncertainty by raising one paw and staring at me with ears slightly lowered, or by tilted their heads without enacting any other movement. From these interactions, I learned to be clearer with my communications.

I was able to design situations for them that posed exciting challenges. Each session in the art studio began with the negotiation as a question — *do you want to go to work*? This question, with an emphasis on the word *work*, signified a type of fun and challenging activity to come. For the mocap experiment, I was determined to use these care processes for the dogs. This resulted in forms of negotiation that led to unexpected results.

On the morning of the first mocap session, I asked Tom and Sugi if they wanted to go to work. They both communicated their enthusiasm with full body expressions; their legs tensed in a upright stance, their bodies angled towards the door, heads held up, ears forward and up, tails up, eyes wide and round looking into mine — *they were ready*. They enthusiastically climbed into the car, understanding that the work would occur at a location other than our own studio. The next negotiation involved inviting them into the mocap studio in order to familiarize them with the space. They freely moved around the studio, exploring its scent, sights, and sounds. They met the mocap technician, (Richard Overington), animator (Jay White), and my human collaborator, Simon Lysander Overstall. Once they became familiar with the space and humans, they communicated that they were interested in what would happen next — they stood close to me and looked at my face.

A practical challenge for the mocap investigation was to design a way to accumulate data from key points on the dogs' moving bodies. Our industrial design consultant (Hyuma Frankowski) created custom-sized, flexible canine mocap suits that allowed freedom of movement. Tiny reflective balls were attached with velcro to the suits, placed at key movement points on their bodies. These reflective points are detected by the cameras and provide data on how the points move in space over time. We discovered that these mocap methods were not suitable for capturing canine facial expressions. The initial head covering portions of the suits were not tolerated by the dogs, who continually tried to remove them with their paws. Because these were bothersome for the dogs, we decided to not use the head pieces of the suits.

Fig. 7. Tom and Sugi putting on their mocap suits. (Photo courtesy of Elisa Ferrari.)

Putting the mocap suits on the dogs was the most contentious part of our negotiation. We started with Tom, but he growled and pulled away as we tried to put it on. We stopped trying with Tom, and approached Sugi instead. He demonstrated willingness by not pulling away. He even seemed to enjoy the attention. We responded to Sugi's cooperation with vocal rewards, smiles, and food snacks. Tom observed the attention given to Sugi, and he agreed to try again. He communicated this by moving towards his suit when I held it in my hand. Sugi's willingness had ignited Tom's competitiveness. A similar negotiation is described by Pepperberg in her interactions with Alex the parrot. She created a method modified from a version first used by ethologist Dietmar Todt (Pepperberg). The *model/rival* learning method involves a human interacting with another human in order to model an interaction for a participating animal. In our case, Sugi took the role of the rival, in order for us model what we were initially asking from Tom.

In the mocap studio, finding means for the dogs to freely contribute their expressions and communications was crucial. We applied a process proposed as *interspecies generative indeterminacy*, in order to allow for the diminishment of human control, thereby foregrounding the *dogs'* contributions. Indeterminacy, a method first described by John Cage, is an art process that provides for diminishment of authorial control, favoring less pre-determined conditions (Jaeger 24). In relation to our processes, the

mocap production sessions did not begin with a preconceived idea of movements and expressions, and therefore the results were indeterminate. The dogs enacted their own movements and expressions defined by their motivations; they walked, ran, jumped, sometimes with me and sometimes on their own. Being open to the dogs' expressions in the space, enacted via their own motivations, allowed their contributions to emerge.

During these sessions, attention was paid to see if the dogs showed signs of fatigue, boredom or frustration. When tiredness set in, we would end the session, usually going only 2-3 hours. Their movements were recorded by the mocap cameras and this provided a database of potential animation material. Over a few short work days, the dogs contributed a variety of material. The best data came from one of Tom's jumps for a ball. It showed a sequence of complex movements that indicated Tom's motivation, and the range of his physical abilities. This data became the material for the animator to model a virtual body of Tom. We agreed that his animation could be the primary contribution to the visual material for the project. A question arose: What was Tom thinking-feeling during this jump? We planned to experiment with animation techniques, and with sound recording and computational methods, to experiment with sensing and representing Tom's thinking-feeling and expression.

In the early days when we would play ball, I would marvel at Tom's focus and athleticism. His highly coordinated muscle responses, his compactness as he moved towards the ball, his speed, and focused attention clearly communicated his intent. If the ball was airborne, he would launch himself into the air to meet it, perfectly aligning his body for interception. He expertly anticipated where the ball would be when he arrived. After he grabbed the ball with his mouth, he would relax, the tension from the chase would leave his body, and he would return to ground gracefully on his feet. Catching it was clearly satisfying for him. This was communicated by how he held his body as he trotted back towards me. He projected happy pride, with head and tail up. He gently rotated the ball in his mouth, as he massaged it with his teeth — the ball had a pleasant mouth-feel. The event of running and catching communicated a complex of shifting feelings and states of mind. The happiness expressed by Tom after he had the ball in his mouth was clear. But I was interested in exploring what he was experiencing just beforehand, as he jumped.

Marc Bekoff proposes a form of attention as "biocentric anthropomorphism," a critical anthropomorphism allowing for considering the other animal's point of view (Bekoff, "Play Signals."). He argues that thinking-like-a-dog, or feeling-like-an-elephant in ethological studies provide for expanded human imagination and compassion, and improved interactions. Biocentric anthropomorphism can be applied in interspecies art

processes, where considering the others' states of mind and feelings are crucial. In my collaboration with Tom, thinking-like-a-dog was an important technique that provided for imaginatively considering his feelings. Applied to the developing project, I imagined that Tom's experience in the moment just before catching the ball was proto-euphoric — potent with eagerness, expectation, anticipation. He would be anticipating the euphoria of the catch. This presented questions about the details of his thinking-feeling.

Fig. 8. Still from animation output for *EPIC_Tom*, 2016, performance at Neutral Ground, Regina, Canada.

Humans tend to experience a prolonged sense of time when anticipating something good. Perhaps this durational shift is experienced by dogs, too, like the dogs anticipating the hotdog rewards in Berns's experiments. How could this be represented in our animation of Tom? Slow-motion visuals have been used in popular film to depict extended time. For example, in the popular film *The Matrix*, slowed-down action, combined with a circling camera point of view around the hero, serves to represent extended temporal experience felt during cognitive focus and intense physical activity. Inspired by its use in *The Matrix*, our animation of Tom was developed into a slow-motion loop depicting his airborne jump for the ball, seen from a circling (virtual) camera point of view. We designed the animation to be continually looping without beginning or end, thereby extending this moment to any length needed for the project.

Tom's focused attention and eagerness was communicated in his chase and jump for the ball. Could these cognitive and emotional states be represented through additional animated forms and sound? Simon and I developed other computationally animated objects that could signify aspects of what Tom was feeling; an animated tennis ball —

the object of Tom's motivation — orbits in the virtual space, just out of reach of his mouth; a quickly circling halo of leaves animated around the figure of Tom creates a juxtaposed movement emphasizing Tom's slowly moving body; a colorful animated aura-pattern surrounds the figure of Tom, suggesting his emotional experience. All of these elements are combined against an animated sky-scape or abstract backdrop that contributes an energetic spatial context.

How may sound play a part to emphasize Tom's thinking-feeling? We investigated how Tom's vocalizations can contribute proto-euphoria aspects. To do this we experimented with Tom in a sound recording studio. As in the mocap studio, I invited Tom to get familiar with space before beginning work. When we started the recording session, I talked to him, and encouraged him to respond vocally. I communicated this by pointing at my mouth while asking him questions, signifying that I was requesting that he vocalize his responses. He contributed a variety of vocal utterances during this process. I used positive voice, facial expression, and food rewards to communicate my appreciation of his responses. As in the mocap session, modes of interspecies generative indeterminacy were used to provide a relinquishment of control for the outcomes. Tom freely responded as he saw fit, and these vocals were recorded. We worked only as long as Tom was interested. After we accumulated hours' worth of responses, we took these recordings back to my art studio to listen.

Fig. 9. Still from animation output for *EPIC_Tom*, 2014, performance at Aberthau Mansion, Vancouver, Canada.

During the listening stage, we found a sequence of utterances that complemented the proto-euphoric qualities of the animation. The recording was a thirty-second-long sequence of five vocal utterances that communicated wonder, desire, excitement, and anticipation. My determination of these emotional qualities was based on evaluating the

utterances in terms of pitch, pitch-shift, and the dynamic changes over time. I relied on my experience with his vocal expressions in previous situations, and what these had expressed. We experimented with extending this vocal recording to complement the time depicted in the animation. We used computational granular synthesis techniques that afforded durational manipulation without changes in pitch. In this way, we were able to extend the 30 second recording to twenty-five minutes to complement the extension of time depicted in the looping animation, but without losing the expressive quality of Tom's untreated utterances. This process revealed the potential to consider the five utterances — now each five minutes long — as movements, as in a musical composition. Therefore, these listening processes helped us determine the project's final form — a live animation and sound performance.

Granular synthesis can apply constrained randomness to play a large number of tiny individual elements in a sound recording — as small as a few milliseconds. The treatment can add texture to the overall sound field, and the parameters of playback can provide additional sonic character. We listened and analyzed the qualities that resulted from various granular treatments on Tom's vocal recordings. The treatments could be used to emphasize the emotional qualities of each movement, and the shifting complexity of the whole. This approach was used to represent Tom's thinking-feeling over time. For example, the first movement uses granular techniques to emphasize the wonder he feels for the ball; the second movement emphasizes Tom's focused attention; the third movement builds excitement; the fourth movement builds anticipation; and the fifth movement emphasizes proto-euphoria. Simon developed software that allowed him to play these sonic treatments live during a performance event. This soundscape is output to speakers in the space, and is used as the score to which participating musicians respond.

We re-examined the animation in order to design visuals to complement each sonic movement. As with the sound software, Simon developed software that could generate visual qualities that complement the feel of each movement. For instance, the circling aura around Tom's animated body was generated from an algorithm that presents a range of possibilities in terms of color, size, shape, location, and motion (see Fig. 9). The software constraints offer a range of possibilities to output an ever-changing aura. The background behind Tom is similarly created using a set of constraints in the software that generates a pattern that shifts, in terms of color and shape. Therefore, the visual treatment for each movement employs a set of constraints that generate a distinct backdrop for Tom's animated body (see Fig. 8). The visual output of the software is

managed by me in the performance, with the results projected onto a screen situated behind the performers.

In the project's performance production stage, we experimented with participatory methods. The methods are informed by performance processes that generate relational potentials between players, and indeterminate results. These afforded the participation of additional musicians who could enhance the sound event. A music method — *call and response* — was used as a technique to produce patterns of interacting between Tom's vocals and the musicians. We conceived that the live soundscape based on Tom's vocals was a durational call that invited participating musicians' responses. A phrase sung or played — *called* — by Tom was responded to by the musicians in the form of another phrase, thereby demonstrating relatings among the players, and a process for building the sonic narrative. This approach incorporated methods of deep listening, improvisation, and musicking.

For the 2016 performances of *EPIC_Tom*, we invited local musicians from the host cities to participate. For Neutral Ground Contemporary Art Forum, Regina, we worked with members of the Regina Symphony Orchestra (RSO), who contributed violin, cello, and flute; for the Pixelache: Interfaces for Empathy Festival, Helsinki, we worked with a jazz duo who played drums and stand-up bass. The rehearsal processes in both instances used methods of indeterminacy; we did not determine in advance what sonic details the participating musicians would provide. Instead, we briefly described each movement in terms of its emotional character, and instructed the musicians to respond to the generated soundscape of Tom's vocals and the granular treatments — as a score. The visual material of the animations provided further cues for the musicians to follow the building narrative provided by the sequential movements. Strict guidelines as to how and what the musicians played were relinquished in favor of emergent sonics.

The rehearsals before the performance generated discussion between Simon and myself with the participating musicians, in order to agree on their approaches given these directions. The processes were unconstrained, in contrast to more conventional music-making situations. This resulted in unique sonic characteristics for each performance. Each was toned by the use of the specific instruments, by the participating musicians' preferred genre, and by the approaches generated from the discussions. For example, the members of the RSO warned that they normally perform under highly constrained conditions set by the musical composition, or by the conductor. For them, improvising responses to the emergent sonics over time was an unfamiliar method, but they were interested in experimenting with this approach. The musicians asked about the details of Tom's experience. It was through the insights generated by this discussion that the

musicians determined what they would contribute. They suggested a building pitch shift — low to high pitched notes — as a musical phrase, to build emotional tension. This phrase would enhance the emotional character of Tom's vocals and the tension between the ball and Tom depicted in the animation.[13] Similarly, in Helsinki, the drummer and bass player discussed with us the cumulative emotional character of the movements towards a whole. This understanding afforded drum and bass approaches that supported the soundscape's trajectory. The drums, in particular, can be heard to build in speed and complexity over the duration of the whole performance. Overall, we suggested that the participating musicians provide an enactment of attention to Tom's sonics, and that this attention inform their responses.

"Deep listening," a technique first developed by Pauline Oliveros in 1979, involves paying attention, as thoroughly as possible, to the sonic characteristics of a given moment. Deep listening processes support a form of democratic listening (Van Nort et al.). Similar methods were proposed by John Cage who emphasized the importance of making an "identification with what is here and / now" (Jaeger). Deep listening can be applied to sound performances that use call and response methods, such as in our project. In order to respond to the sonics unfolding, a listener must enact two forms of attention: focus on the details of the immediate sonic event — such as a series of pitches —, and a global focus on the sonics of the total soundscape. These forms of attention were applied in the performances of *EPIC_Tom*, where the participating musicians use deep listening as attention to the emergent characteristics — texture, pitch and rhythm — of Tom's call. The musicians combine this attention with improvisational techniques to model their sonics. Improvisational techniques are important to apply in this process, because it is not possible to fully anticipate the details of soundscape; the musicians must play adaptively, in contrast to how they may play in more constrained musical events. Globally, the musicians follow the structure of the soundscape based on its five movements and their unique treatments. These methods afford an enactment of ethical listening, and response to more-than-human expression. Therefore, the methods propose a novel process for the participating musicians, and for the audience.

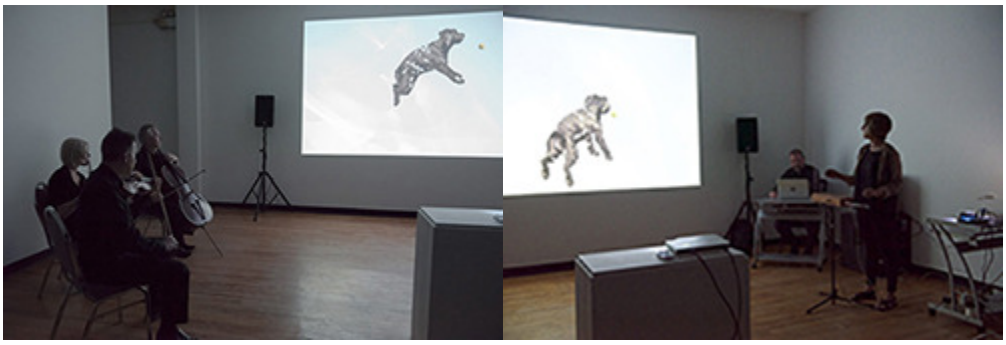

Fig. 10. ***EPIC_Tom*****, 2016 performance at Neutral Ground, Regina, Canada, showing the participating musicians, members of the Regina Symphony Orchestra—Simon MacDonald violin, Simon Fryer cello, Marie-Noelle Berthelet flute (left); Simon Lysander Overstall and the author (right).**

EPIC_Tom is not a musical work *per se*, but more crucially an action. Musicking, in contrast to *music*, describes a social act that establishes relationships — among performers, with an audience, and with larger societies. The project's participatory methods with Tom and the musicians, and with the audience, are a form of "musicking" (Small). Canine voice and communicative gesture are the focus of social sound-making with improvising musicians, thereby proposing interspecies creativity on the fly in front of a public. The project explores more-than-human relating through a positive relinquishing of human-centric authorship towards interspecies creativity. Therefore, the project takes on larger societal dimensions where attention to other-than-human communication and creativity is demanded. *EPIC_Tom* experiments with uncertainty and interspecies generative indeterminacy, thereby undermining assumptions about mastery.

Fig. 11. ***EPIC-Tom*** **performance at Interactive Futures 2014: More-Than-Human Worlds Compassionate Interactions and the Ethics of Aesthetics, symposium, April 24-25, 2014, Vancouver. (Photo courtesy of Leah Weinstein.)**

Notes

1. The US produces 6,200,000 puppies per year combining stats on household births, small breeders and commercial breeders. The population of dogs is stable, so Coppinger claims that that means 6,200,000 dogs die each year. 4,000,000 dogs spend part of a year in an animal shelter, 2,400,000 are euthanized or die in these shelters (Coppinger and Coppinger). Clearly there is a need to adopt dogs rather than breed more.

2. Pound for pound, dogs eat more than humans, generally twice as much. This is because the normal canine body temperature — 101.5 degrees Fahrenheit — is higher than human's 98.6. It takes more calories to maintain this higher temperature. Dogs who spend time outside in cold temperatures have to generate even more heat and eat more. In terms of weight, active puppies need two to three times as many calories as a resting adult dog (Coppinger and Coppinger).

3. Views within homeopathic medical practice suggest that vaccinations can cause over-stimulation to the immune system in some dogs leading to allergies and other ailments (Hamilton 372-382; Goldberg).

4. Both Bekoff ("Wild Justice") and Horowitz (196-204) discuss observations of justice and fairness in canine play.

5. Horowitz (78-79) argues that dogs are not necessarily inclined to be scent-trackers without training.

6. Oxford English Dictionary. The definition includes 1. Eating at, or pertaining to, the same table. 2. Biol. Applied to animals or plants which live as tenants of others (distinguished from parasitic).

7. Neuroscience can offer a means for evidencing animal neurological activity. However, it should not be the sole basis of making determinations about animal consciousness including emotions and intentionality. Nor should it be a basis for extending ethics to other animals. Neuroscience can be used detrimentally to support speciesism based on comparisons of other animal's neurological systems to those of humans—a form of anthropocentrism. Further, neurological experiments on other animals may be conducted in ways that compromise that being's autonomy, and/or cause harm.

8. See projects "Aria," "EPIC_Tom", and "Rockstar" (Andreyev).

9. Rhinos, elephants, bats, cats, and humans also have the vomeronasal organ. It is speculated that this organ is used by humans to detect pheromones from other individuals (McClintock).

10. Some researchers suggest that this number is underestimated by more than half over the last half decade because of poor monitoring of the industry (Balcombe 7).

11. The report states that most studies that attribute meat production as 10-35 percent of global greenhouse gas emissions; differences based on excluding or including deforestation (Schwarzer).

12. *Aria* (2009); *Bikeride* (2009); *Screen Tests* (2009); *Rockstar* (2010); *Wait* (2011).

13. See video documentation here: http://julieandreyev.com/epic-tom/. This link shows a 4 min video and sound output from performance at Neutral Ground, May 21, 2016. Produced in collaboration with members of the Regina Symphony Orchestra—Simon MacDonald violin, Simon Fryer cello, Marie-Noelle Berthelet flute—curated by Brenda Cleniuk, Neutral Ground Contemporary Art Forum, Regina.

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