Multispecies thought from the shadows: the associated worlds of dog-walking

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Abstract

This paper develops the concept of multispecies thought through a study of dog-walking in a public park in Lancaster, England. It draws on cybernetic ideas from Bateson, Peircean semiotics and von Uexküll's *umwelten* to explore how multispecies worlds come into being in the spaces of the park, and amongst humans, dogs, leads, toys and other things. It focuses on how an understanding of multispecies thought can be discerned that is not only specific to the situated relations in dog-walks, but also constituted through routines that foster new capacities between specific bodies. In this way, we come to understand multispecies worlds as located at the sites where specific, associated worlds are co-produced by dogs and humans yet reducible to neither. We use the examples of lead-walking and play with balls and frisbees to show how semiotic relations are co-produced across species. Building on previous work, we confront species-defined notions of capacity and thought and look instead at how the indexical relations of multispecies thinking offers liberatory potential.

Keywords

human-dog relations, multispecies, semiotics, thought, umwelt, worlds

Introduction

Gregory Bateson used a now-famous thought experiment to upend received understandings of mind. Suppose, Bateson asked, he was blind and using a walking stick. Where could it be said that he – the thinking self – started perceiving the environment? Where his hand gripped the stick? Where the stick met the ground? Somewhere along the stick? Bateson answered that such questions were non-sense. Mind has no essential site. Rather, understanding thought required appreciating how different

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ways of knowing were distributed through pathways, relations and feedbacks. In other words, it was the person-hand-stick-ground system that mattered, not the boundary separating the 'inner' world of thought from what lies outside it. Bateson argued that explaining coevolutionary cultures of human thought required treating the 'body-in-the-environment', or what he termed an ecology of mind.[1]

Bateson's work prompted significant inquiry into how distributive pathways of thought extend beyond humans. For instance, Donna Haraway mobilised Bateson to consider how dogs act in ways attuned to their companion people, towards mutual ends and enjoyment.[2] This article pursues Bateson's insight by asking: where is multispecies thought when multiple bodies-in-the-environment of humans and dogs together co-produce everyday experiences of dog walking? In answering this question, the article's core contribution is a conceptualisation of multispecies thought, not as two 'inner' worlds – one of dogs one of humans – meeting in an external world, but through associated worlds coproduced through bodies-in-their-environments. Taking plurality as a premise, rather than an aim, we encourage a non-anthropocentric geography of thought that is irreducible to individuals and mutually cast through multispecies relations.

The section 'Towards multi-species thought' reviews multispecies research and more-than-human approaches to dog-human relations in geography. It distinguishes a line of inquiry following the semiotics of Charles Sanders Peirce, who treated thought as signs that are not exclusive to humans. It also draws on Jakob von Uexküll's notion of an *umwelt* composed by intersubjective, shared worlds of species. Together, these provide tools for conceptualising multispecies thought. The next section, 'Cybernetic leads,' presents qualitative research into how dogs and humans mutually attune to each other by focusing on the lead as a cybernetic pathway of the kind Bateson described. The section 'Frisbees, balls and multispecies worlds' considers the semiotic co-production of worlds through play. Finally, the section 'Conclusions from the shadows' concludes by discussing a theme across the article regarding the power of routine and care in everyday, multispecies thought of humans and dogs.[3]

The research took place in Williamson's Park, Lancaster (UK), through participant observation with six sets of dog-walkers and dogs, following their usual routes to, through and back from the park for between 1 and 2 hours, over the course of 4 months. As Lee and Ingold argue, walking methodologies are especially suited to attuning to socialisation in shared environments.[4] They note attunement is not automatic, and this research follows multispecies practices to consider animals as active social participants in dog-human relations shaped over time through habit and routine.[5] The location was selected owing to I.N.'s embeddedness within the dog-walking community and focused ethnographic attention on human-dog *relations* – signs created *through* dog walking – while reflecting on ethological findings during interpretation and analysis. Human participants were all white, cis and predominantly women. All names are pseudonyms.

Towards multi-species thought

Dog-walking is a complex sensory activity, one culturally significant owing to its ubiquity as an everyday multispecies practice.[6] Previous work on dog-human relations examines non-human agency in conversation with scholars such as Haraway, Latour's actor-network theory and new materialist accounts, including what Barad terms intra-action, 'which recognises that distinct agencies do not precede, but rather emerge through, their intra-action'.[7] Power, for instance, examines how more-than-human relations shape how dogs become family members.[8] Brown and Dilley argue for closer attention to Haraway's idea of response-ability – the capacity to respond – to understand dogs as actors in public spaces.[9] Srinivasan argued free-living street dogs in India co-produce new moral geographies.[10] Entangled, more-than-human relations of kinship, responsibility and ethics are arguably magnified in training sessions. Fox and others show how dog training sessions are transformational experiences of multi-species learning as dogs and humans

mutually – if differentially – attune to one another.[11] In these works, the environment is not external to human-animal relations. Rather, as Smith and others show in their examination of 'ontological choreographies', objects such as leads and toys operate as technologies for mutually attuning police dogs and handlers.[12] For Michael, technologies like leads produce new forms of hybridity, or co(a)gents.[13]

Our focus on multispecies thought responds to calls for attention to the mutual influences of dogs and humans on one another during dog-walking.[14] Despret highlights the mutual attunement of human and animal bodies by considering how ethologists attend to the bodies of animals to redistribute pathways of knowing that problematise distinctions of subject from object.[15] For Laurier and others, dog-walking geographies entail understanding not only human-animal relations, but a refusal to site dog minds inside their heads as external 'objects' about which human subjects produce knowledge. They note 'if one holds that a dog's mind is inside its head, then whether the dog's body is in a laboratory or assisting a rescue team is merely incidental'.[16] Laurier and others provide a fillip for extending work on the mutual attunement of dogs and humans to multispecies thought. They note how, during walks, 'tension on the lead is mutually produced' and not merely the external locus of conflicting intentions between otherwise 'inner' minds.[17] Sadetzki and Hirsch-Matsioulas extend this theory of the lead, arguing it produces a 'multi-agent unit' of dog, lead and human.[18] As Despret argued – following Deleuze – these entangled relations require thinking not of humans and dogs (or other creatures) as inhabiting discrete worlds that interact with one another, but rather as living together in an '*associated world*' that emerges through mutual coexistence.[19]

Despret's claims engage Jakob von Uexküll's notion of *umwelt* and his well-known example: the tick. The tick's subjective world, or *umwelt*, is sensed through three capacities: up or down, warm or cold and the presence or absence of butyric acid, which is emitted from mammalian bodies and light-roasted coffee. Less well appreciated in von Uexküll's work, however, is how he highlighted shared intersubjective worlds across species.[20] Unlike the 'bubble' of a subjective *umwelt*, for von Uexküll, intersubjective relations are more like musical composition. Critically, these mutually composing relations require pathways of intra-action; ways of producing an associated world together with other species or what Haraway described as 'becoming-with' others through entangled relations.[21] As we show below, whereas Despret leaves out von Uexküll's musical metaphor, these insights open a pathway for composing multispecies thought.

We put von Uexküll to work in a broader theoretical orientation focused on understanding multispecies thought. Our work can be distinguished from geographic conversations with ethology that, as Lorimer explored in conversation with Deleuze, have an important tenure for interspecies sociality and notions of personhood.[22] Our approach is also distinct from Barua and Sinha, who seek insights into 'aspects of animals' urban political ecologies'.[23] Important though gaining insight into 'dynamics of animals' urbanisation, knowledges, and space' is, our aim is different.[24] We examine not the worlds of other species (i.e. dogs) but how multispecies thought emerges through mutually entangled species and environments. Without seeking distance from ethology, our emphasis on understanding *associated worlds* of human-dog relations requires a theory of signs that is not primarily interpretive of external behaviours, but constitutive of multispecies thought. The remainder of this section develops this view by pushing further on how Eduardo Kohn combined Bateson, von Uexküll and Peircean semiotics which included, notably, Kohn's own work on how dogs dream.[25]

For Bateson, the basic unit of information is the transferal of 'difference' in a learning feedback loop.[26] This is key to Bateson's notion that thought extends beyond the self to wherever difference might arise – such as in the walking stick example. It is an idea Kohn extends through the semiotics of Peirce, who held that all thought takes place as signs, and that signs – hence thought – is not

restricted to humans.[27] Peirce was frank about nonhuman thought. 'Thought is not necessarily connected with a brain', he argued, it exists 'throughout the physical world' in the coordination of everything from the work of bees to the formation of crystals.[28] Peirce defended this view through his theory of signs, or semiotics, to argue that 'not only is thought in the organic world, but it develops there'.[29] There is a rich literature on Peircean semiotics, and its tripartite division of signs into: icons, which represent the likeness of things; indices, which physically point to something in the way a weathervane indexes wind direction, and; symbols, or the conventions used in language.[30] As is also well-covered, signs are relational; they require an interpretant to forge a triad together with the sign and the thing signalled.

Critical for Peirce is that signs are continuous. One thought is used to interpret another in a lifelong 'train of thought'.[31] As Lane shows, the result is a social notion of personhood shared across individuals that arises owing to how thought-signs are themselves shared; as Peirce put it, 'we ought to say that we are in thought and not that thoughts are in us'.[32] Kohn mobilises this idea to argue that, owing to how we are 'emersed in an ecology of selves', relations among humans, animals and plants are 'constitutively semiotic'.[33] In this way, human entanglements with the nonhuman world point to an ecological account of shared thought not restricted to humans. As Kohn argues, for instance, forests literally think: 'a forest qua forest manifests thought and is not just the product of our thinking'.[34] Indexical signs hold special significance owing to how more than one species may both produce signs, or be interpretants of them, in ways that point to something to which they are mutually attuned. That is, something thought together. Mutually attuning to a shared environment is often emphasised in studies of human-dog relations, and in our account the role of indexical signs takes on special significance.

Indexical signs are social too, and we argue that they can be co-produced by species mutually attuned to one another. Shadows, themselves a literal indexical relation, are a helpful metaphor for conceptualising our approach. Shadows are indexical owing to how they point in literal terms to what casts them. They are also marked by relations beyond individual bodies; they shift with the time of day or year, latitude, sources of light and so on. Further, a single shadow can be co-produced by multiple bodies in ways that are irreducible to any one individual. That can be accidental, but it can also be an outcome of mutually attuned bodies. Shadows are also spatial. They fall somewhere in relation to the body or bodies that cast them, and the relation of those bodies in their environments. The indexicality of shadows is also salient for understanding multispecies thought owing to how indexical signs co-produced by dogs and humans form a train of thought that is not reducible to either's 'inner' world. These are obviously not literal shadows, but they are jointly produced physical (i.e. indexical) relations to something in the environment. To get at these kinds of indexical signs it is helpful to revisit and deepen our understanding of shared, 'associated worlds' through von Uexküll's notion of ecological composition.

As noted, von Uexküll used a 'bubble' to conceptualise the *umwelt* inhabited by ticks. However, von Uexküll also elaborated on a musical metaphor to understand the mutual composition of interspecies worlds. For this, he relied on the 'contrapuntal relations' in which the point-counterpoint steps of a contrapuntal movement find an ecological corollary. Photosynthesis and plant respiration are one example, with such relations together constituting an organism's ecological niche.[35] This point-counterpoint relation opens an opportunity to consider intersubjective relations as they co-produce what Schroer terms a shared *umwelt*. Schroer applies this to ethnographic work with falcons and human falconers. In those cases, the inter-bodily skilling that occurs during training creates a 'partially shared umwelt', one in which falconers describe their own perceptual capacities as influenced through bodily 'attunement' with the birds.[36] The musical metaphor of tuning is generative and often found beyond von Uexküll in work on affective multispecies relations. It picks up on studies of human-dog relations cited above too, as well as how Lorimer and

others describe attunement as an embodied process of 'learning to be affected'.[37] For Schroer, attunement provides for a kind of 'affective relationality' that emerges as falconers and falcons shape their associated world.[38] Worlding, in the sense used here, is a contingent 'becoming with' others. As Schroer argues, the 'creative and interconnected position' of mutually attuned individuals is central to von Uexküll's theory, an insight only available once composition is raised to parity with the 'bubble'.[39]

Critically, Schroer's development of von Uexküll entails the rejection of taxonomic, species categories as the 'loci of specific meaning making'.[40] Meaning is shared across species. This creates an opening to consider further not only how different species learn together, but also how they think together. To treat thought as coproduced in an associated world, we argue, Peircean semiotics can be productively adjoined with Bateson's attention to pathways of knowing and von Uexküll's approach to composition.[41] Our theoretical gambit opens space to consider how intersubjective, multispecies thought is geographically situated in worlds co-produced by humans and non-humans. It echoes Blaser's concern for what is missed when species boundaries are reified and the call for a 'radical openness' that risks 'one's own categories of recognition'.[42] An account that goes beyond species-defined capacities for meaning-making challenges such categories.

Indexical signs don't all point in the same way, and Haraway's description of interspecies training and play is important to thinking about plural forms of thought and care as not merely reproductions of relations. Haraway uses the example of her experience of the sport of dog agility, with her Australian Shepherd Cayenne to consider a-reproductive relations. Training and play reject logics of reproduction and Haraway lingers on the experience of a 'large spiritual and physical' joy shared between her and Cayenne.[43] This moral reference point moves towards a notion of care which goes beyond the reproduction and maintenance of life. Practices such as play can be seen, for instance, as a 'reciprocal/equal form of interspecies interaction'.[44] As we return to in the conclusion, everyday routine and play during dog-walking are imbued with care. There is direct care for life, but there is also care and joy mutually shared as dogs and humans not only think about each other but also with each other.

Cybernetic leads

When multispecies attunements are made central to research, the idea of 'learning to be affected by animals' has significant methodological potential.[45] As I.N. engaged in practices of attentiveness while participating in dog-walks, interpretations were developed by thinking across accounts of attentiveness itself. For van Dooren, attentiveness means 'to know another in their intimate particularity' and thereby learning to 'better respond' to one another.[46] Moreover, the practice of walking is a methodological aspect of engendering attentiveness. Rhythmic interspecies movements, such as dog-walking or horse-riding, demand a physical engagement as embodied, complex activities.[47] Attentiveness is here a practice of knowing and being in relation, what Barad refers to as ontoepistemology.[48] Attentiveness shaped how I.N. came to know, learn and respond to the indexical shadows of multispecies thought. In this way, the ethnographic aspect of the research was essential to attentiveness and to participation in the trains of thought co-produced during dog-walking. The indexical signs encountered during dog-walking were constituted by a cybernetic chain of the kind Bateson envisioned: the human-lead-dog-environment.

While I.N was walking with human Rosie and her dogs Humphrey and Cleo, Rosie held the ends of both leads which were slack, both dogs trotting in pace. Suddenly, one lead pulled taught, jerking her hand. She stopped and turned to look at Humphrey who had stopped and was sniffing in some grass by the path, '*sometimes they get a smell and won't move*' she commented. This intention-expressing quality of the lead has been observed by Aspling and others, who state that the

directional orientation of the lead reveals a dog or human's intention to the one on the other end.[49] Being on one end of a lead is in this sense to be in constant contact with the human or dog on the other end. The materiality of the lead as (generically) a long, malleable piece of material allows it to embody vibrations, orientations and tension. All of this communicates sensory information between dog and human. As Laurier and others note, 'tension on the lead is mutually produced', making it more than a site of paternalistic restraint by the human.[50] Comparable to Bateson's person-hand-stick-ground analogy, a Rosie-lead-Humphrey system formed Rosie's and Humphrey's sense of one another's movements, allowing them to share information and feedback on their orientations, speed and locations without always looking at one another. They form, as Sadetzki and Hirsch-Matsioulas suggest, a 'multi-agent-unit' while on the lead, one that allows both dogs and humans to shape direction, speed and rhythm.[51] Here, the lead's presence in the system is a pathway that adds capacities for shared knowledge.

An indexical, sensory connection informed Rosie when Humphrey and Cleo came across something that made them stop. Rosie interpreted invisible scents from their indexical sniffing activity, an act of sensory perspectivism. Their full semiotic and sensory world is beyond Rosie's direct awareness. Through the lead, however, the distinct olfactory atmospheres of a human and a dog have been connected by a tether through which their sensory worlds meet. The use of leads across dog-walks I.N. went on meant I saw variations in how human-lead-dog systems were oriented, their tension, proximity and frequency of use. Notable changes occurred at significant points in terms of safety and behavioural etiquette, for example where Rosie and Humphrey prepared to cross the road to the park. Rosie pulled the lead back on Humphrey before crossing, predicting he would try to start crossing as soon as they stopped at the point where they usually cross. She reported this happened frequently at this point in the walk, commenting she believed Humphrey could smell food cooking from a school canteen across the road, making him eager to follow the scent and cross. When we had checked it was safe to cross, she moved forwards with her body while maintaining a taught lead. Humphrey crossed close by her side, straining on the lead.

Here the use of the lead constitutes an anticipatory act of care,[52] preventing a potential road collision involving Humphrey. Rosie's staunch posture and firm grip on the lead pre-empted Humphrey's straining towards the road in an act of restraint. The reciprocal tension of the lead conveyed Humphrey's intent to cross and her intent to wait. For Bateson's cybernetics, this constitutes learning through how 'repetitions and oscillations observed in energy flow' amount to 'meaningful news'.[53] The awareness provided by the transferal of *meaningful news* through the lead thus creates a mutually reciprocal sequence of information flow, acts and more information flow. In this way, quotidian acts like crossing the road constitute rudimentary acts of interspecies thought as sensory worlds of Rosie and Humphrey coproduce an associated world. Rosie's awareness of traffic risks intersects with Humphrey's (perspectively understood) scent-world through the cybernetic flow of information along the lead. The routine nature of the place, time and experience of the road-crossing makes Rosie's anticipatory acts possible. In this way, the Rosie-lead-Humphrey system of thought is contingent on a broader ecology of relations and routine.[54]

Ecologies of care

Acts of restraint, like the Rosie-lead-Humphrey road-crossing, occurred on many dog walks. In one case Jane put her dog Basil on the lead when passing another dog they had altercations with before. Across dog-walks humans would often increase the tension on a lead to get the dog to allow someone to pass by. Dog-walkers often explained to me that these acts were based on routine or historical experiences of walking with a particular dog. These attunements between the bodies of dogs and human walkers extended beyond and between different dog-human pairings. As in the

case of the Rosie-lead-Humphrey-road-crossing system, these systems are not closed from disparate scent, sight and sound-worlds, bodily affects or human and dog conceptions of etiquette. As such, Bateson's cybernetic system extends to the 'traffic-danger-Rosie-lead-Humphrey-food-smell' system. This system is not necessarily experienced wholly by anything that takes part in it: human, dog, lead or traffic. The extension of perceptual worlds and affective attunements is not infinite but is ever-shifting, incorporating new others encountered throughout the walk. These others – like cars, other dogs and so on – are continually interpreted through the signs and information flows of those amid their everyday ecologies.

As the cybernetic lead-system is situated within a broader ecology of shifting relations in the park, care for others extends in many ways as encounters multiply. For example, during a walk with Dave and Amelia, and two dogs, Buster and Stella, we approached another dog-walking group, who Dave exclaimed were friends. One of the dogs we were approaching acted strangely as we came near them, holding back, shaking and wagging her tail in tight little wags. Dave puzzled at her behaviour and commented that it must be because Buster and Stella were approaching on the lead and the familiar dog was off-lead. Her human walkers agreed. This guess implies that (at least) some dogs perceive dogs on and off the lead as in different kinds of relations as they approach. Here, the presence of the lead conveyed information, and not only physical restraint, in ways that affected how dogs encountering one another behaved. This highlights the significance of the lead in informing relations between a human-lead-dog system and approaching others amid their own relations of bodies-in-the-environment. It matters that this system can be assembled and disassembled, as noted by Bateson in his own cybernetic analogy.[55] The connection of the lead between a dog's collar or harness and a human's hand is not always in place. Rather, the appearance of dogs on the lead or off matters to other dogs in ways that creates difference for the shared human-lead-dog systems encountering each other in the park.

Jane claimed that Basil was comforted by being on the lead. It calmed him down when passing other dogs and humans. His calmness was at least visibly apparent, becoming less energetic and aggressive when on the lead. Jane believed her explicit use of the lead for emotional management to be effective, especially when encountering strange dogs and humans. This opens the possibility for exploring the lead as a technology for managing emotions during encounters. Leads transmit sensory information regarding the intentions of dogs and humans in their disparate but overlapping sensory worlds. It is not simply a tool of restraint or control, as tension itself is part of a system of information, rather than simply a disruption to 'good' walking. The lead enables information to be mutually transferred. It allows responses to such information to be enacted in ways that accrue over time and manifest as care.

The information conveyed by leads can also provide what Laurier and others term 'spatial-oriented features',[56] such as orientation with regards to the other on the end of the lead. Cultivating mutual attunements over time, in the way that Rosie and Humphrey do when crossing the road, constitutes learning through this system of bodies, things and environments. The repeated use of the lead facilitates the development of anticipatory responses, not only responses to in-the-moment information. This can be seen in the Rosie-Lead-Humphrey road-crossing system. This capacity to learn through and share in interspecies thought enables humans and dogs to act in a state of increased awareness of the intentions and experiences of the other, to an anticipatory point.

Off-lead time

When walking with human Anna and dogs Lilly and Skye, the lead was actively used to manage Lilly's engagement with the spaces of the park. From years of walking in the park with Lilly, Anna explained, she has learned to put her on the lead at the points where Lilly would often run off. By

running off, I.N would find out, Anna meant leaving the path and not coming back for several minutes, despite being called. This happened during the walk. At one corner Lilly suddenly trotted off into the surrounding woodland, not responding to Anna's calls. Heading down a crumbly slope in pursuit of Lilly, we soon heard a dog barking. The boundary of the park came up against a garden, where a Vizsla was excitedly barking at the fence. The man who lived there said he had seen Lilly go past. By the time we got back to the path, Lilly was waiting for us. In this context, the misalignment of sensory and semiotic worlds created, for me and Anna, the sense of an adversarial misalignment of desires. Anna's failure to anticipate Lilly's intent to run off and Lilly's disappearance appeared to us as a disruption to the walk. In this case, off-lead time necessitated a high level of attentiveness towards Lilly on Anna's part. Compared to moments of on-lead misalignment of intentions, this required other forms of active awareness of one another's actions relying on, for example, vision and sound. The relatively large distance between us and Lilly, the fact that we couldn't see her, and that she didn't return made us anxious to find her.

Off-lead time was not always synonymous with a sense of threat and loss of connection on dog-walks. But at this moment, Anna and I felt worried and frustrated, laughing at ourselves and our situation; it conveyed the smallness of the world of dog-walking, both of physical boundaries of the park itself and its paths, and the sense that once things occur that a specific human can't immediately interpret and manage, things have gone wrong. Successful dog-walking can be defined, from a human perspective, by the effectiveness of managing movement through the park. The lead reveals itself, successful or not, as a technology for managing concerns about safety and control through knowability and restraint. The significance of the dis/assembled state of the lead speaks to its capacity for mediating indexical shadows in the coproduction of associated human and dog worlds. The fear of an inadequate capacity to mutually understand and compromise on intentions may be what borders this form of interspecies care. While Lilly's agency was always in action, her (possible) autonomy did not fit with the kind of care premised on the park as a place bounded by a singular world.

Frisbees, balls and multispecies worlds

The presence of balls, frisbees and sticks contributed greatly to some dog-walks. These provided an opportunity to propose play at specific spots. One dog, Luna, would stop at routine spots, waiting for the frisbee to be thrown. Once the frisbee had been thrown a few times, she lay down and would refuse to have me pick it up for a few minutes while she rested. As I reached down to pick up the frisbee, she would pick it back up. I soon learned that my reaching for the frisbee was an indexical sign of my intention to throw it for her, not an action I was guaranteed to carry out. In this way, she trained me to ask. This inter-body skilling amounts to an act of multispecies worlding.[57] Habit, memory and space are key to this development, as noted in Smith and others work on police dog training.[58] Luna's selection of places to stop, usually hills and slopes, my indexical reaching-for and her snatching-away of the frisbee evoked an awareness in me and a new semiotic capacity. Much like Schoer's falconers, my perceptive capacities were altered by this process of learning with Luna and the frisbee, producing a partially shared *umwelt* of frisbee- and place-mediated semiosis.[59]

This was not the only moment where my semiotic missteps in multispecies games became apparent through my clumsy etiquette. Ball-throwing on walks with human Hannah and border collie Jet had a similar structural significance as the frisbee on Luna's walks. Jet would carry the ball between certain spots on the path, stopping ahead and waiting for us to arrive and participate in *the game*. Hannah commented '*It's all her invention*', not only with regards to Jet's choices of where to stop but also the ball game itself. Jet would stop at a favoured slope and Hannah tossed the ball up, Jet chasing and catching it. Sometimes Jet would lose the ball or drop it and watch it

roll down the slope. When this first happened, I reached for the ball, assuming this had been a breakdown in the game. Hannah reprimanded me, '*Don't you find the ball. That's her job!*'. The significance of this situated specificity among bodies and things in developing mutual attunements revealed how signs were to be interpreted. My experience as a human, who has played with many dogs, did not provide me with the semiotic information needed to participate properly in Luna and Jet's games. Here, the power of decentring the category of 'species' as the point of departure for sensory and semiotic knowledge is made plain.[60] It makes visible the temporal and spatial specificity of relations among multispecies bodies. The production of a partially shared *umwelt* is defined not only by the possibilities for the overlap of species-specific sensory capacities, but also by the spatial contingencies, histories and routines between specific bodies-in-the-environment. The signs and interpretations Jet and Hannah went through had been mutually constituted by them in a way that may or may not be obvious to others – like a shadow, however, their associated world was visible through *the game* thought up together. Further, such moments of play were imbued with the joy of developing attunements between dog and human bodies. Being 'in on the game' opens possibilities for fun, as Goode's detailed ethnographic work on human-dog relations richly describes.[61] Watching Luna or Jet race after their respective frisbee and ball was delightful and a great deal of the build-up to such games was in the playful back and forth of eye contact and indexical proposals. Luna and Jet were both visibly excited in the moments before their toys were thrown, tails wagging, bodies poised and making steady eye contact.

Haraway has written on her delight at watching the physical movement of her dog Cayenne.[62] The joy of being able to provoke visible joy in others through, for example, taking up Jet's invitation to throw her ball, came as much from its anticipation as the moments she was chasing the ball. Physical attunement itself contributes to Haraway's notion of the joy of play, where 'players make each other up in the flesh'.[63] The activity of playing, as I experienced first-hand and observed the dog-walks, was a moment of intense mutual awareness. At other points in the walk, humans and dogs would often have differing focuses, for example Humphrey's apparent desire to follow the scent of canteen food cooking across the road. During play, both dogs and humans directed great attentiveness towards one another. Jet's eyes flicked between me, Hannah and the ball as she waited for us to throw it and would always return to us and drop the ball in anticipation of another round. In these ways, developing capacities to engage in proposals and acts of play created a partially shared *umwelt* based around the creation of joy. Abby described a sense of bonding through her play with Luna. Intense affects thus developed from their partially shared *umwelt* of play. The joy described by Haraway and experienced and observed by myself on these dog-walks cannot be described without the relation between a dog and a human. In this way, the joy-in-attunement I observed on the dog-walks constitutes both the means and the ends of dog-human play.

Semiotic confusion

Dog-walks weren't a perfect system of multispecies semiotic or sensory attunement. Sometimes breakdowns and miscommunications would occur. In Haraway's writings on training in agility classes with Cayenne she describes the building up of attunements and their moments of breakdown, seeing miscommunications as being forced 'respond to the authority' of the other party.[64] Discussing miscommunications thus allows us access to how associated worlds emerge. For example, in a few spots around the park, Luna would stop at places we could not get to in order to throw her frisbee. She would stand at the top of a ledge, drop the frisbee and watch us intently as we failed to acknowledge her proposal in the routine way, calling her and walking on. Abby, Luna's human, explained that this happened often, and that they had yet to work out how to resolve this repeated breakdown in communication.

Luna's confusion is comparable with how Kohn reinterprets von Uexküll's tick through Peircian semiotics.[65] Kohn argues the tick doesn't have the capacity to discriminate among different mammalian pheromones but that through a 'productive iconic confusion' it conflates all mammals as like one another and so knows well enough, within its own *umwelt*, when to drop onto a potential host.[66] Luna's choices of places to throw can also be seen as an iconic confusion – *all these places bear the likeness of play spaces* – in which she does not discriminate between places that are too steep for humans to access and those that are not. This is not to say that Luna cannot perceive the differences in steepness. But degrees of steepness perhaps do not appear to Luna as what Bateson would call 'meaningful news' when it comes to gameplay.[67] For Luna, slopes are iconic of playing frisbee. For myself and Abby, the over-steepness of a slope prevented us from participating in frisbee-throwing. In this case, interspecies worlding that produced disparate playful *umwelten*.

Dog-walking as multispecies worlding can be marked by confusion or misunderstanding. In this case, a blockage was produced by the very semiotic and sensual attunements that allow the creation of shared *umwelten* in dog-walking. Luna's practice of selecting slopes around the park to propose frisbee-throwing was something that allowed Abby and Luna to play together in a particular environment. The iconicity of slopes with frisbee-throwing developed from this practice. The very same confusion means Luna sometimes chooses slopes too steep for Abby to access. This splintering of *umwelten* has become a routinised confusion on their walks, according to Abby. If, as Schoer argues, *umwelten* are interdependently connected through 'a broader web or resonance of relations' then differences and tensions are, perhaps, inevitable.[68]

There are ways to navigate mismatched *umwelten*. Meta-communication in-between animals has been described by Bateson and developed by Haraway as a mode for loosening meanings from their functions.[69] A common example is the 'play bow' used by species, such as dogs, to indicate that their behaviour is not aggressive before engaging in a mock fight.[70] Comparably, metacommunication among Rosie, Humphrey and Cleo helped avoid miscommunication. Rosie used the word *bin* to indicate to the dogs that she was going to dispose of Humphrey's poo bag. She needed to do this, she explained, because Cleo, who is an older dog, would normally try to turn back at this point and would not know that going to the bin was a short detour before going home. From experience, she knew he would resist going to the bin. She believed he perceived it as an undesired continuation of the walk. So, she developed the use of this word every time she wanted to use the bin and turn back, signalling to Cleo and Humphrey that this was only a short walk to the bin. It is doubtful whether Cleo or Humphrey knew the symbolic meaning of 'bin', but the metacommunication allowed Rosie, Humphrey and Cleo to mutually index an understanding that worked for them. Here, multispecies thought does not rely on reconciling the 'inner' worlds of different agents but on an indexical overlap in an associated world – like a shadow where outlines of different bodies coproduce one shape. In such a case, the shared *umwelt* is experienced differently by Rosie and the dogs. Nevertheless, owing to its mutual composition, the shared *umwelt* encompasses shared practices of worlding that do not require shared interiority to one material reality.

Conclusions from the shadows

Minds are not merely inner worlds. They extend, as Bateson, Haraway and others suggest, through relations that make a difference. The associated worlds that this study observed were full of signs co-produced by the creatures and things of the park. Indexical relations connecting dogs and humans generated new capacities in the ostensibly bounded selves of the dog, lead and human. Slopes became iconic of play. The transferal of difference within these systems allowed multispecies thinking and learning that cannot be isolated to one site of 'mind' among the myriad relations linking bodies and environments.[71] There were affective changes associated with the assembled or

disassembled state of the human-lead-dog system too. For example, Basil's apparent calmness on the lead, Anna's displeasure at Lilly's disappearance while off the lead, and the strange behaviour of the dog encountered on the walk with Dave, Amelia, Buster and Stella. Across these encounters, the lead acted as a technology for managing emotions, safety and control, in an often human-led attempt at enabling specific kinds of multispecies thoughts and foreclosing others. But this is not all the lead does. It is also a site of mutual sign-sending.

The lead speaks to materially mediated, multispecies thought through signs. Signs that are social, and which require both attunement and metacommunication. Above, we identified the potential for thinking through the partiality and potentiality of these signs in terms of shadows. It is an attempt to move beyond species-centric categories to think, ala Bateson, about bodies-in-their-environments and, with von Uexküll, through the contrapuntal relations that mutually compose associated worlds. To think about objects like leads, slopes, play bows, or *the game* is to understand them as active presences in material meaning making. Thought, in the Peircean point of view, is something one *'does* over time' and not something one 'has at any given instant'.[72] Just as leads come alive with vibrations when used, shared (yet different) perceptions of other objects and environmental qualities, such as a bin, road, smells or a ball, constitute a shadowy world of meanings and affects. That a frisbee or ball can be carried, picked up or dropped by a human or dog allows for both mutual attunements to develop around their presence and indexical signs to find interpretants across species boundaries. In the cases of Luna and Jet, the dogs initiated proposals of play while carrying toys. Other objects such as treats, poo bags, whistles and sticks also made indexical appearances. But there is no guarantee that the stability of signs on one walk will automatically transfer to another – there is instead a persistent relation that builds up multispecies thought over time.

Routine plays an important role. To think with von Uexküll's notion of 'contrapuntal relations', is to think of how worlds are not constituted by unidirectional acts on passive others or an unaffected environment. Instead, worlds are coproduced with associated meanings, such as danger and functionality in the case of the road, and places of play, such as slopes for throwing frisbees or balls. Rosie's *bin* metacommunication to Humphrey and Cleo demonstrates the signifying capacity that emplaced physical objects have for Rosie and the dogs. Only through routine and repetition did this capacity emerge and concretise. Routine-in-place also contributed to Luna's iconic confusion about slopes. Routine in dog-walking thus enables dogs and dog-walkers to become intimate such that, when confusions do emerge, they are consequential within a shared *umwelt*.

While there were sometimes confusions, the generation of emplaced multispecies thinking often allowed dog-walking groups to become more accountable to one another; such groups gained capacities to care.[73] Shared concerns of safety, etiquette and play emerged. These were characterised by attunement and confusion, fear, affection and joy. Play, especially, produces intense focus between dog-walkers and their dogs. The creation of joy as a key aspect of worlding between dogs and humans on walks invokes a form of care that is deeply embodied, affective and, as Haraway argues, spiritual. In this context, attentiveness and attunement can be seen as the producer of joy through the development of acts of proposal, acceptance and play itself. The ontoepistemology of attunement manifests in anticipation and being 'in on the game'. Multispecies play reveals care not simply in the 'labour of maintaining life' but also in a-reproductive, joyful moments.[74] Playfully shared *umwelten* emerge as spaces of potentiality and intense attentiveness, that must be enacted to be known.

The crux of this research is the question of multispecies thought. If discourse 'constrains and enables' what can be said,[75] worlding enables and constrains what can and cannot be done – what multispecies thoughts can be thought. Our claim is that, like shadows, multispecies thoughts index pathways of knowing that move beyond species-centric categories to consider how multiple

bodies-in-the-environment both frustrate efforts to isolate thoughts to 'inner worlds' and liberate multispecies research to consider acts of co-creation and co-production oriented not to individuals but to mutual *relations*. Shadows, in this sense, provide purchase on how worlds are cast across and with one another in multispecies relationships. They also, in the contrapuntal spirit of von Uexküll, provide a counterpoint in which confusions in games of play and routine are not merely evidence that species differences exist, but that what constitutes 'difference' in multispecies thought turns on the pathways through which bodies-in-the-environment relate to and with one another.

Associated worlds move geographic research towards cultures of multispecies thought. Geographies that risk species-defined capacities and in which routines and histories between specific bodies and objects became significant.[76] This is an act of displacement, where the shared umwelt of a specific human and dog produces its own space for expression. As Humphrey's indexical sniffing points to what Rosie can't detect by herself, so multispecies worlds, rich with body-specific attunements, shadow dog-walkers in the park. In his analysis of how dogs dream, Eduardo Kohn argued for a focus beyond 'how humans represent animals to an appreciation for our everyday interactions with these creatures and the new spaces of possibility such interactions can create'.[77] The indexical relations through which objects signpost phenomena require special attention to place owing to the ways that signs reverberate in physical relations to their environment. So too in the case of shadows cast in ways that are species indeterminant and where relational geographies of dogs and humans coproduce worlds in which bodies-in-the-environment think together.

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Notes

1. G.Bateson, *Steps to an Ecology of Mind* (Chicago: University of Chicago Press, 2000), p. 446.
2. D.Haraway, *When Species Meet* (Minneapolis: University of Minnesota Press, 2008).
3. T.Holmberg, 'Walking, Eating, Sleeping. Rhythm Analysis of Human/Dog Intimacy', *Emotion, Space and Society*, 31, 2019, pp. 26–31.
4. J.Lee and T.Ingold, 'Fieldwork on Foot: Perceiving, Routing, Socializing', in S.Coleman and P.Collins (eds), *Locating the Field: Space, Place and Context in Anthropology* (London: Routledge, 2006), pp. 67–86.
5. H.Buller, 'Animal Geographies II: Methods', *Progress in Human Geography*, 39, 2015, pp. 374–84. H.Smith, M.Miele, N.Charles and R.Fox, 'Becoming with a Police Dog: Training Technologies for Bonding', *Transactions of the Institute of British Geographers*, 46(2), 2021, pp. 478–94.
6. T.Fletcher and L.Platt, '(Just) a Walk with the Dog? Animal Geographies and Negotiating Walking Spaces', *Social & Cultural Geography*, 19(2), 2018, pp. 211–29.

7. K.Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham: Duke University Press, 2007), at 33.

8. E.Power, 'Furry Families: Making a Human-Dog Family Through Home', *Social and Cultural Geography*, 9, 2008, pp. 535–55.

9. K.Brown and R.Dilley, 'Ways of Knowing for 'Response-Ability' in More-Than-Human Encounters: The Role of Anticipatory Knowledges in Outdoor Access with Dogs', *Area*, 44, 2012, pp. 37–45.

10. K.Srinivasan, 'Remaking More-Than-Human Society: Thought Experiments on Street Dogs as "Nature"', *Transactions of the Institute of British Geographers*, 44(2), 2019, pp. 376–91.

11. R.Fox, N.Charles, H.Smith and M.Miele, ''Imagine You are a Dog': Embodied Learning in Multi-Species Research', *cultural geographies*, 30(3), 2022, pp. 429–52.

12. Smith et al., 'Becoming with a Police Dog', p. 479. Cf, X.Cherkaev and E.Tipikina, 'Interspecies Affection and Military Aims: Was There a Totalitarian Dog?', *Environmental Humanities*, 10(1), 2018, pp. 20–39.

13. M Michael, *Reconnecting Culture, Technology and Nature: From Society to Heterogeneity* (London: Routledge, 2000).

14. Fletcher and Platt, '(Just) a Walk with the Dog?'.

15. V.Despret, 'The Bodies We Care for: Figures of Anthropo-Zoo-Genesis', *Body & Society*, 10(2–3), 2004, pp. 111–34.

16. E.Laurier, R.Maze and J.Lundin, 'Putting the Dog Back in the Park: Animal and Human Mind-in-Action', *Mind, Culture, and Activity*, 13(1), 2006, pp. 2–24, at 3.

17. Laurier et al., 'Putting the Dog Back', p. 12.

18. Y.Sadetzki and O.Hirsch-Matsioulas, 'Leashing the City: Dog-Leash-Human Entanglements and the Urban Space', ACI'21: Eight International Conference on Animal-Computer Interaction 1, Bloomington, 8–11 November 2021, Association for Computing Machinery, New York, pp. 1–7, p. 9.

19. V.Despret, *What Would Animals Say If We Asked the Right Questions?* (Minneapolis: University of Minnesota Press, 2016), p. 165, original emphasis.

20. F.Ginn, 'Jakob von Uexküll Beyond Bubbles: On *Umwelt* and Biophilosophy', *Science as Culture*, 23(1), 2014, pp. 129–34.

21. D.Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham: Duke University Press, 2016).

22. H.Lorimer, 'Forces of Nature, Forms of Life: Calibrating Ethology and Phenomenology', in B.Anderson and P.Harrison (eds), *Taking-Place: Non-Representational Theories and Geography* (Ashgate: Farnham, 2010), pp. 55–78.

23. M.Barua and A.Sinha, 'Animating the Urban: An Ethological and Geographical Conversation', *Social & Cultural Geography*, 20(8), 2019, pp. 1160–80, at 1161.

24. Barua and Sinha, 'Animating the Urban', at 1162.

25. E.Kohn, 'How Dogs Dream: Amazonian Natures and the Politics of Transspecies Engagement', *American Ethnologist*, 34(1), 2007, pp. 3–24.

26. Bateson, *Steps*, p. 464.

27. E.Kohn, *How Forests Think: Toward an Anthropology Beyond the Human* (Berkeley: University of California Press, 2013).

28. C.S.Peirce, 'Prolegomena to an Apology for Pragmaticism', *The Monist*, 16(4), 1906, pp. 492–546, at 523.

29. Peirce, 'Prolegomena to an Apology for Pragmaticism'.

30. See T.L.Short, *Peirce's Theory of Signs* (Cambridge: Cambridge University Press, 2007). C.Misak, *Truth and the End of Inquiry: A Peircean Account of Truth* (Oxford: Oxford University Press, 2004).

31. C.S.Peirce, 'Some Consequences of Four Incapacities', *Journal of Speculative Philosophy*, 2(3), 1868, pp. 140–57.

32. R.Lane, 'Persons, Signs, Animals: A Peircean Account of Personhood', *Transactions of the Charles S. Peirce Society*, 45(1), 2009, pp. 1–26, p. 5.

33. Kohn, *How Forests Think*, pp. 104, 83.

34. E.Kohn, 'Forest Forms and Ethical Life', *Environmental Humanities*, 14(2), 2022, pp. 401–18, p. 404.

35. M.Tønnessen, 'Umwelt Transitions: Uexküll and Environmental Change', *Biosemiotics*, 2(1), 2009, pp. 47–64.
36. S.Schroer, 'Jakob von Uexküll: The Concept of *Umwelt* and its Potentials for an Anthropology Beyond the Human', *Ethnos*, 86(1), 2021, pp. 132–52, at 142, 143.
37. J.Lorimer, T.Hodgetts and M.Barua, 'Animals' Atmospheres', *Progress in Human Geography*, 43, 2019, pp. 26–45, at 39.
38. Schroer, 'Jakob von Uexküll', p. 144.
39. Schroer, 'Jakob von Uexküll', p. 140.
40. Schroer, 'Jakob von Uexküll', p. 147.
41. J.von Uexküll, *A Foray into the Worlds of Animals and Humans* (Minneapolis: University of Minnesota Press, 2010).
42. M.Blaser, 'On the Properly Political (Disposition for the) Anthropocene', *Anthropological Theory*, 19, 2019, pp. 74–94, p. 77.
43. Haraway, *When Species Meet*, p. 228.
44. T.Hodgetts and J.Lorimer, 'Methodologies for Animals' Geographies: Cultures, Communication and Genomics', *cultural geographies*, 22, 2015, pp. 285–95, p. 289.
45. Lorimer et al., 'Animals' Atmospheres', p. 39.
46. T.van Dooren, E.Kirksey and U.Münster, 'Multispecies Studies: Cultivating Arts of Attentiveness', *Environmental Humanities*, 8(1), 2016, pp. 1–23, p. 17.
47. A.Game 'Riding: Embodying the Centaur', *Body & Society*, 7(4), 2001, pp. 1–12.
48. K.Barad, 'Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter', *Signs*, 28, 2003, pp. 801–31.
49. F.Aspling, O.Juhlin and E.Chiodo, 'Smelling, Pulling, and Looking: Unpacking Similarities and Differences in Dog and Human City Life', Proceedings of the 12th International Conference on Advances in Computer Entertainment Technology, Association for Computing Machinery, New York, 64, 2015, pp. 1–9.
50. Aspling et al., 'Smelling, Pulling, and Looking'.
51. Sadetzki and Hirsch-Matsioulas, 'Leashing the City', p. 9.
52. Brown and Dilley, 'Ways of Knowing'.
53. P.Harries-Jones, ''Steps' to Agency: Gregory Bateson, Perception, and Biosemantics', *Biosemiotics*, 10, 2017, pp. 211–28, p. 217.
54. Bateson, *Steps*, p. 446.
55. Bateson, *Steps*, p. 464.
56. Laurier et al., 'Putting the Dog Back', p. 16.
57. Schroer, 'Jakob von Uexküll'.
58. Smith et al., 'Becoming with a Police Dog'.
59. Schroer, 'Jakob von Uexküll', pp. 142–43.
60. Schroer, 'Jakob von Uexküll', p. 146.
61. D.Goode, *Playing with my Dog Katie: An Ethnomethodological Study of Dog-Human Interaction* (Chapel Hill: Purdue University Press, 2007).
62. Haraway, *When Species Meet*, p. 228.
63. Haraway, *When Species Meet*, p. 175.
64. Haraway, *When Species Meet*, p. 221
65. Kohn, *How Forests Think*, p. 85.
66. Kohn, *How Forests Think*.
67. Harries-Jones, ''Steps' to Agency', p. 217.
68. Schroer, 'Jakob von Uexküll', p. 140.
69. Haraway, *When Species Meet*, pp. 239–40.
70. Haraway, *When Species Meet*, p. 239.
71. Bateson, *Steps*, p. 464.
72. Lane, 'Persons, Signs, Animals', p. 5 original emphasis.
73. Barad, *Meeting the Universe Halfway*.

74. A.Krzywoszynska, 'Caring for Soil Life in the Anthropocene: The Role of Attentiveness in More-Than-Human Ethics', *Transactions of the Institute of British Geographers*, 44(4), 2019, pp. 661–75, p. 664.
75. Barad, 'Posthumanist Performativity', p. 819.
76. Blaser, 'On the Properly Political', p. 77.
77. Kohn, 'How Dogs Dream', p. 4.

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