Linguistic Frontiers • 6(2) • 2023
DOI: 10.2478/lf-2023-0015

sciendo

Linguistic **Frontiers**

Can nonhumans speak? Languaging and worlds in posthumanist applied linguistics

Original study

Eugenia Demuro[1], Laura Gurney[2] (ORCID: 0000-0003-3416-2967)
1 Research Strategies Australia (eugeniademuro@researchstrategiesaustralia.com)
2 University of Waikato (laura.gurney@waikato.ac.nz)

Received: February 2023, Accepted: April 2023

Abstract: This paper mobilises posthumanism as a way to theorise and articulate what *language(s)/languaging* may be for nonhuman animals. This is investigated via various concepts brought together: we turn to the ontological turn in anthropology to expand on what language is, or might be, amongst humans, and then discuss *Umwelt* and *languaging* as two possible modes of exploring ontologies and biosemiosis among nonhumans. The dialogue between posthumanism and biosemiosis is so far absent in the field of critical language studies. The aim, thus, is to contribute to the nascent field of posthumanist applied linguistics by tentatively linking discrete fields of enquiry for a productive exchange across disciplines, and to further the discussion of how nonhuman language is (or may be) ontologised.

Keywords: language(s)/languaging, posthumanism, Umwelt, Uexküll, Maturana and Varela, languaging.

INTRODUCTION

In the humanist tradition, language is a marker of human exceptionalism which hierarchically differentiates homo sapiens from others. This definition is limited on both cultural and species grounds, and there are two aspects of this limitation that need to be examined. Firstly, the mechanism by which language is linked to human exceptionalism is typically premised on a universalised notion of what constitutes language. Here, language is multiplicable into the plural *languages*, which are presented as separable and definable codes characterised by a relatively high level of stability across time and space (Kubota, Miller 2017; Love 2004; Orman 2013; Wei 2018). Furthermore, languages are often seen to correspond or belong to particular territories and peoples (Canagarajah 2006; Makoni, Pennycook 2006; Wei 2018). In this account, other possible ontological apprehensions of *language(s)/languaging* – a hybrid term employed to appreciate the variety of human linguistic practices (combining language, languages, and languaging) – are foreclosed (see Demuro, Gurney 2021). Secondly, as the apparently exclusive domain of the human, salient definitions of language uphold the superiority of the *Anthropos*. Communication and semiosis beyond the human are often not defined as language in a strict sense of the word (Johansson 2015; Pepperberg 2017); that is, from this perspective, only humans have the capacity for language.[1] Pennycook (2018a) explains that the uniqueness of our language separates 'us' (homo sapiens) from 'them' (others): this is "a necessary proposition for the belief that language is a system separate from broader modes of communication, a system that sprang into being in an evolutionary jump rather than a more commonplace development from animal modes of communication" (455).

Open Access. © 2023 Eugenia Demuro, Laura Gurney, published by Sciendo
This work is licensed under the Creative Commons BY-NC-ND 4.0 license

Using these intertwined premises as a springboard, this paper engages posthumanist critique – primarily via the work of Braidotti (2013, 2019a, 2019b) and Ferrando (2013, 2016a) – to expand ontological conceptions of language within and beyond the practices of humans. Building on recent work in language ontologies (Demuro, Gurney 2021), we employ the term *language(s)/languaging* to allow for an apprehension of linguistic practices as inherently multiple. The use of language(s)/languaging emphasises linguistic multiplicity and the fluid and heterogenous ways in which language may be conceptualised and mobilised. In other words, language can function as code, but it may also be constituted as a practice; it may be apprehended as singular or plural, or may be constituted as an indeterminate apparatus or assemblage (Gurney, Demuro 2022). We refer to language(s)/languaging in an attempt to neither privilege nor exclude any account of how language is constituted.

Posthumanism has the potential to further contribute to the expansion of language(s)/languaging by allowing us to conceive new possibilities for how language and agency are defined (see Pennycook 2018b), including how language is a component of world-making practices. It is necessary to note, however, that this paper draws selectively on posthuman scholarship, and creates interdisciplinary synergies across a range of fields—language studies, anthropology, biosemiotics—to extend the discussion of language(s)/languaging to nonhuman animals. While we do not disregard the technological realm of machinery, cyborgs and artificial intelligence within posthumanism (and explicitly within transhumanism), we foreground instead the *biosemiotic* development of linguistic practices over long timescales.

The paper proceeds as follows: firstly, we define the posthuman condition as a response to the apertures and limitations of the humanist project, before turning to the nascent body of posthumanist scholarship in applied linguistics. We then discuss language(s)/languaging in an attempt to begin discerning nonhuman linguistic practices. Our argument draws on scholarship from the ontological turn in anthropology (see Blaser 2009; de la Cadena, Blaser 2018; Henare, Holbraad, Wastell 2007; Heywood 2017; Holbraad, Pedersen 2017) considered alongside the biosemiotic work of Uexküll (2010), and the work of Maturana and Varela (1987).

FROM HUMANISM TO POSTHUMANISM

Humanism is a central tenet of Western cosmology and philosophy (Peters 2015), although it has inarguably also been critiqued through the Western canon.[2] A useful starting point involves situating humanism historically, as a sceptical and autonomous movement fomented to counter dogmatic thought – particularly the belief in the supernatural and the afterlife – in favour of the self-determination of human individuals and collectives. In the European context, humanism originated as a reaction against orthodox religious practices and the power structures with which these were caught up preceding the Enlightenment. By the start of the twentieth century, humanism denoted particular approaches to life distinguished "by the valuing of human beings and human culture in contrast with valuing gods and religion, and by affirming the effectiveness of human reason applied to evidence in contrast with theism, theological speculation, and revelation" (Copson 2015, 2).[3]

Describing the term as a post hoc coinage, Copson (2015) argues that no singular individual founded humanism, but that its tenets are more accurately described as a set of interrelated beliefs making up a coherent and non-religious worldview, and which have evolved over time.[4] However, although humanism has arguably aimed to universalise the human experience across contexts and cultures – paving the way, for instance, for such projects as universal human rights – this universalisation has attracted critique from within the humanities as well as other scholarly disciplines.[5]

Braidotti (2013) argues that the 'human' of humanism is primarily a 'normative convention'. This human, she writes, "spells out a systematized standard of recognizability – of Sameness – by which all others can be assessed, regulated and allotted to a designated social location" (26). Braidotti (2013) claims that the specific model of humanness on which this standard is premised has acquired "transcendent values as the human: from male to masculine and onto human as the universalized format of humanity" (26). In brief, the universalisation of the human through humanism is grounded in historical and ontological-epistemic foundations.

Humanities scholars operating within fields such as feminist, postcolonial, cultural and media studies have indeed raised radical critique of what it means to be considered (not fully) human. Predominantly, discussions have concerned how the category of human may be expanded to be more inclusive. However, the non-representativeness of Universal 'Man' – "implicitly assumed to be masculine, white, urbanized, speaking a standard language, heterosexually inscribed in a reproductive unit and a full citizen of a recognized polity" (Braidotti 2013, 65) – is only one of the two axes raised by posthumanists. The other axis concerns the assumed anthropocentrism at the core of humanist work, including its critical variants. Indeed, Braidotti (2019b) argues that this anthropocentrism "is so intrinsic as to remain unthought-of and therefore under-examined" (p. 1183).[6]

While posthumanism has grown in strength and articulation over the last few decades (see Barad 2003; Braidotti 2006, 2019a; Callus, Herbrechter 2012; Ferrando 2013), it continues to elude easy classification. In this paper, we employ the work of Braidotti as a productive foray into the field. Braidotti (2013) articulates a nuanced definition of posthumanism while relies on two parallel components: 1) 'a convergence' of anti-humanist and post-anthropocentric perspectives, and 2) a 'tool or method' to engage with conditions of advanced capitalism. Thus, in addition to expanding the category

of the human, the posthuman is also *post-anthropocentric*; that is, there is a displacement of both Universal Man and the expanded homo sapiens to allow for the attribution of agency to *other* beings, including nonhuman animals and machines.[7] This critique is grounded responsively within contemporary political, economic, social and environmental conditions, often intentionally problematising the separation between these. Similarly, Ferrando (2016b) situates posthumanism as a *practice*. She writes that posthumanism is "a practice of existence which fully acknowledges post-anthropocentrism as the necessary paradigm shift in the manifestation of our futures, alongside with [sic] a post-humanistic perception of the human species in the broader frame of post-dualism" (Ferrando 2016b, 159–160). To unpack this definition, several key concepts require elaboration, including what is meant by the Anthropocene and the Anthropos, and how these link to post-dualism.

A somewhat contested term, the Anthropocene names a new geological epoch based on the impact of humans on the planet (see Steffen et al. 2018). It denotes contemporary circumstances where the Earth has "left its natural geological epoch", the Holocene, and is "rapidly moving into a less biologically diverse, less forested, much warmer, and probably wetter and stormier state" (Steffen, Crutzen, McNeill 2007, 614). The genus of these changes are human activities which, although historically long-reaching, have accelerated significantly in the past 300 years (Steffen, Broadgate, Deutsch et al. 2015; Steffen et al. 2007) leading to the current state where no ecosystem on Earth is untouched by human influence (Vitousek, Mooney, Lubchenco et al. 1997, 494).[8] The ontological shift of humanity from participants in the Earth System to being able to fundamentally define many of its processes (S. L. Lewis, Maslin 2015) is the primary characteristic of the Anthropocene; that is, a new geological and climactic epoch defined by the Anthropos.

The Anthropos, a term used to invoke humanity, is a key element of the posthumanist project. Wolfendale (2019) explores the status of the Anthropos before and during modernity, critiquing it across four premises. Firstly, Wolfendale (2019) highlights how the natural sciences have slowly challenged "the supposed uniqueness of our animality" (57), relocating homo sapiens within the natural world rather than in a separate cultural category. The second premise is the critique of the purported universality of Man, as "masculine, bourgeois, and European" (57). The third premise concerns the advancement of technologies which have the capacity to change human cognition, thus potentially modifying key components of what makes us human. Finally, Wolfendale (2019) points to the interlinked environmental crises of the Anthropocene, which have caused societies to confront "the impermanence of the natural order underlying the residual vestiges of the classical worldview" (57). It is this nexus of premises, Wolfendale (2019) argues, that demands a change in our "self-consciousness […] *to develop an inhuman alternative* to classical humanism and its modern remnants" (emphasis added, 57). In a similar fashion, Braidotti (2019b) relocates the posthuman knowing subject as follows:

> […] the knower—the knowing subject—is neither Man—*Homo universalis*—nor Anthropos alone. The knowing subject is no longer the liberal individual, but a more complex transversal ensemble: of *zoe*/geo/techno-related factors, which include humans, as collaboratively linked to a material web of human and non-human agents. (1186)

The invocation of *transversal ensembles* is premised on a post-dualist cosmological foundation. At this stage of its theoretical development, posthumanism is still primarily responsive to the persistent vestiges of modernity in the humanities and cognate fields. The dualist cosmology of modernity, forged in the metaphysics of René Descartes, has posed challenges for the ways in which we have conceptualised ourselves across the axes of nature/culture, human/nonhuman, and material/immaterial. Via its axiomatic separation of nature and culture onto separate planes, modernity produces a disjuncture for definitions of humanness – *homo sapiens* is an animal species, while humanity is a 'moral condition' for which we must strive, and which excludes all other animal species (Viveiros de Castro 2004). As such, modernist cosmology has postulated "a physical continuity and a metaphysical discontinuity between humans and animals, the continuity making of humankind an object for the natural sciences and the discontinuity making of humanity an object for the humanities" (Viveiros de Castro 2004, 475). However, it is at this point that a constructive intersection between the natural and social sciences becomes visible. As explored in what follows, we argue that the posthumanist applied linguistics project should embrace an interdisciplinary approach in its quest to move *beyond* language as an exclusively or even primarily human phenomenon.

POSTHUMANISM IN APPLIED LINGUISTICS

The nascent beginning of a posthuman turn can be noted in applied linguistics, based predominantly in the work of Alastair Pennycook and Roslyn Appleby (Appleby, Pennycook 2017; Pennycook 2018a, 2018b). In broad terms, posthumanism in the field has been defined in alignment with other work in the posthumanities, "either in terms of changes to the human condition brought about by environmental and technological change or as challenges to the notion of humanity as a modernist ideal" (Pennycook 2018b, 447).

Pennycook (2018a, 2018b) discusses the implications of posthumanist thought for applied linguistics. To provide contextual grounding, Pennycook (2018a) asserts that, "[a] humanist account of communication suggests brains in cognitive isolation encoding and decoding ideas in and out of language and passing messages back

and forth between themselves" (16). Subsequently, Pennycook (2018b) argues the need to rethink the relationship between language, representation, and materiality, as "there is no longer a world 'out there' separate from humans and represented in language but rather a dynamic interrelationship between different materialities" (449). Bringing these ideas into the context of language, there are clearly significant implications. Paraphrasing Pennycook (2018b), if we understand language and cognition not as properties inherent to and internalised within human individuals, but rather as distributed, then "multimodal and multisensory semiotic practices of the everyday include the dynamic relations between semiotic resources, activities, artefacts, and space" (446). This is an assemblage-oriented approach, drawing on the work of Deleuze and Guattari (1987), where language occurs at the interface of, and in the intra-action between, heterogenous actants (see Gurney, Demuro 2022). Through this framework, language is primarily captured via a relational ontology.

While we do not disagree with this approach, and share with Pennycook the desire to rethink language, in this paper we emphasise a different pathway towards posthumanist applied linguistics, via anthropological frameworks and theories of *biosemiosis*: we argue that nonhuman animals experience and participate within their *ontologically determinate worlds*, and practice forms of meaning-making and communication that can be construed as modes of *languaging*. To ground our discussion, we use as a theoretical platform the scholarship of anthropology's ontological turn, contextualized within language (Demuro, Gurney 2021), but extended beyond the human. In our contribution to the posthumanist turn in linguistics, and broadly speaking, we attempt to address the following question: How does the apprehension of language(s)/languaging as a component of world-making practices *amongst* and *beyond* humans allow for a posthumanist foray into applied linguistics? The sections that follow are tentative steps in contemplation of this task—exploring ontology, Umwelt, and languaging—as a means to think through other-than-human practices.

LANGUAGE(S)/LANGUAGING AS WORLDING AMONGST HUMANS

Different accounts and performances of language constitute different language ontologies. Our argument here is that ways of understanding language do not merely stem from different perspectives on what language is, or from different language ideologies, including beliefs or ideas about language structures (see Errington 1999; Woolard, Schieffelin 1994), but rather from particular *practices* which ontologise – or (re)create – language in specific ways. We move away from the notion that language exists 'out there' to argue that language(s)/languaging resides in the practices that bring it into being: "language practices, and the theoretically-defined conceptions of language which correspond to these, are grounded in and revealing of particular ontologies' (Demuro, Gurney 2021, 1).

In examining language in an ontological register, we do not aim to be exhaustive in our discussion of potential or existing ontologies of language—neither for our understanding of human or other-than-human practices. Our argument rests on the premise that there exist *multiple* and *co-existing* ontologies of language which are embodied through performances (see Demuro, Gurney 2021). However, the task of developing a taxonomy of language ontologies is not only beyond our scope but counterproductive. There are, arguably, as many ontologies of language as there are practices, speakers, communities, actants—however we choose to define these. Our aim here is to provide a brief sketch of ontology and its relation to language(s)/languaging.

The ontological turn has been primarily driven through work in anthropology and related fields, such as science and technology studies. Whilst difficult to define conclusively, Kohn (2015) defines ontology as "the study of 'reality'—one that encompasses but is not limited to humanly constructed *worlds*" (emphasis added, 312). Ultimately, the ontological turn explores multiple 'ways of being' (Escobar, 2016), 'knowing and doing' (Henare et al. 2007), and 'multiple co-existing realities' (de la Cadena, Blaser 2018).

Examining language in an ontological register allows us to simultaneously consider multiple ways of understanding what language *is* or *might be*, without critiquing them normatively or ranking them hierarchically. That is, language in an ontological register may be more than *any singular account*, depending on the practices, also referred to as processes of *worlding*, that bring it into being. As Blaser (2013) explains, "[o]ne can speak of a given worlding or ontology as long as one can trace its enactment" (p. 553; see also Blaser, 2009, 2016). Further, as Demuro and Gurney (2021) argue, these enactments and practices "do not constitute singularised ontologies, sitting like bubbles within an external arena, but rather generate ongoing, overlapping and heterogeneous *storied performativities"* (emphasis in original, 5). Blaser (2013), in explaining the term storied performativity, states that, "[e]nactments or practices are storied, and stories are themselves enacted" (552): that is, practices are underpinned by worlds (storied), they are world-making (enacted), and the worlds they create or reveal are multiple and heterogenous. Holbraad (2020) provides the following summary of this body of work:

> One way to think of anthropology's so-called "ontological turn" is as an attempt to offer a way out of the by now quite hackneyed dilemma in the philosophy of social sciences, between explanation and interpretation [...] The problem with explanation and interpretation, goes anthropology's ontological argument, is that they both presuppose that

> anthropologists are in principle equipped even to describe the social phenomena in which they are interested […] To ask *why* something is as it is, you must first know *what* it is. (emphasis in original, 495–496)

Holbraad (2020) suggests instead that the task of the theorist is *conceptualisation*, "not merely as a step toward some other, weightier anthropological goal, such as social explanation or cross-cultural translation, but as a *sui generis* end in itself" (515). In order to work towards more accurate conceptualisation of social phenomena, we look to practices and accounts: how they are *done* and how they are *explained*.

Social phenomena are constituted through practices, by which we mean the totality of actions, interactions, relations, pronouncements, and so on, that bring a particular apprehension of language into existence. In this sense, different practices *world* different accounts of language. The existence of grammar textbooks and dictionaries, for example, corresponds to particular accounts of language that in turn make it possible to conceive and identify standard linguist forms, correct uses of norms and rules, and appropriate lexicon. We may argue, however, that these forms exist alongside other practices that may intentionally (or not) subvert them. Such subversive practices have been well illustrated through recent scholarship on the multilingual turn and (trans)languaging (Becker 1991; Bloome, Beauchemin 2016; G. Lewis, Jones, Baker 2012; Wei 2018).

What happens, however, when practices and enactments are less recognisable or more abstruse? How do we identify language(s)/languaging when the practices that reveal particular ontologies are not easily discernible as such? Do plants have language and, if so, what kinds of features might it have (Affifi 2013; Ryan 2020)? How does an earthworm communicate and make meaning? Furthermore, how would they *story* or enact this?

Another aspect of thinking in an ontological register – as per work in anthropology – is of mobilising ontology as a *heuristic* to transform our conceptual repertoires (Holbraad in Carrithers, Candea, Sykes, Holbraad 2010; Pedersen 2012).[9] Ontology becomes a means by which we – the thinker, researcher, or language theorist – can examine the tools at 'our' disposal and possibly develop new tools, according to the worlds that are encountered. Viveiros de Castro (2015) similarly argues that thinking in an ontological register prompts us to consider "how to create the conditions of the ontological self-determination of *the other* when all we have at our disposal are our own ontological presuppositions" and concludes that we must "always leave a way out" for those who are the subject of our research (emphasis added, 11). Here, the ontological register is a way to make sense of that which exists outside of 'our' frame of reference. Further, while Viveiros de Castro (2015) deals with the limits of ontological presuppositions in relation to the anthropological human 'other' – i.e., Western modernity's other – we would argue that it is equally necessary to tease out the limitations of our ontological conditioning when the subjects of our attention are nonhumans. What are the pre-ontological assumptions that we bring to bear in our theoretical and analytical apprehension of language, and how do we 'leave a way out' for other actants or participants of the language(s)/languaging matrix?

In drawing on this literature, our argument does not de-politicise studies of language or promote relativism; on the contrary, the turn to ontologies of language is political in two ways. Firstly, it represents a move away from frameworks created within, and inherently tied to, a singular definition of language and its correlates. Rather than attempting to capture what language *is*, approaching language(s)/languaging through ontology – as a practice, performance, enactment, etc. – apprehends language as always a multiplicity. Further, ontology as a heuristic means that the ethnographic encounter, rather than being an opportunity to apply existing frameworks of analysis, prompts us, instead, to reflect on the capacity of our frameworks to understand that which is encountered (or which is occurring) and to attempt to create new frameworks as needed. This requires reflexivity and an openness to how others understand, interact with, and constantly (re)create the worlds we/they inhabit. Reflexivity is a key characteristic of criticality (see Kubota, Miller 2017). Secondly, this paper considers how we may extend this predominantly anthropological approach *beyond* the Anthropos. This attempt to explore ontology beyond humanity draws on work in Umwelt and in biosemiotics; however, we do so to generate a dialogue with work which takes a more anthropological approach to ontologies of language(s)/languaging as social phenomena. We experiment with what language might mean to *all* those who perform it, being inclusive as to who 'those' might be.

In this task, the turn to language ontology becomes a conduit—an effort and a gesture—to problematise our assumptions and to consider practices which may reside outside of known frames. What are the implications of this for how we apprehend what language is or may be? Linguistic anthropologists offer suggestions here. For Chernela (2018), language in an ontological register prompts a holistic view of language. For Hauck and Heurich (2018), language may in fact be a range of different 'things': signs, actions, practices, cultural resources, and even "something that we might not yet have the right vocabulary to describe" (1). That is, what language is or may be, even amongst humans, is not certain.

In what follows, we discuss how an expanded conception of language(s)/languaging may be receptive to the examination of language from a posthuman perspective. The core question is: if ontologies are created through practices and enactments, how do nonhuman practices produce ontologically different or diverse accounts of language(s)/languaging?

BEYOND THE HUMAN: SEMIOSIS AND LANGUAGE ACROSS SPECIES

As briefly discussed, the question of how language is ontologically constituted is far from clear amongst humans. To begin to explore how a posthumanist applied linguistics might respond here, we see as a productive step the critique of some of the chasms which have separated human language studies from biosemiotics. As Deely (2015) observes, the "dependency of life — plant, animal, human — upon semiosis is clear and constant" (345). However, as a starting point in the discussion of nonhuman language(s)/languaging from an applied linguistics perspective, it is useful to address the distinction between meaning-making and language-making. If meaning-making (semiosis) and language-making (linguistics) are conceptualised as separate phenomena, then the demarcation of semiosis and linguistics within and across species becomes possible. Arguably, discussions can then productively attune themselves to the *fact* of meaning-making, on the one hand, or the *practice* or *specifics* of language-making on the other. However, the variation in human language practices poses the first challenge to a cleanly delineated, species-based linguistics project, as supported by empirical studies (Evans, Levinson 2009; Levinson, Evans 2010) as well as ontological work (Demuro, Gurney 2021). As Evans and Levinson (2009) argue:

> [...] languages differ so fundamentally from one another at every level of description (sound, grammar, lexicon, meaning) that it is very hard to find any single structural property they share. The claims of Universal Grammar, we argue here, are either empirically false, unfalsifiable, or misleading in that they refer to tendencies rather than strict universals. Structural differences should instead be accepted for what they are and integrated into a new approach to language and cognition that places diversity at centre stage. (429)

Secondly, the rather blurry outline of language across species further problematises a clean separation between semiosis and linguistics (Augustyn 2018; Pepperberg 2017). The question of 'who uses language' has remained as problematic as the question of 'what language is'. Pepperberg (2017), commenting on the legacy of interspecies communication studies (and lamenting the reduction of studies in the field), asserts that studies of animal language conducted during the twentieth century began serious discussions about key questions: what are the hallmarks of language? How did language evolve amongst humans? How do spoken languages differ from sign languages, which have been taught to animal research subjects? Reflecting on studies in which animals were taught to use human languages, Pepperberg (2017) problematises the *tabula rasa* assumption:

> [c]learly, some common neural architecture enabled disparate nonhuman species to achieve a level of symbolic representation and rule-governed behavior, suggesting that some such abilities were likely in their natural communication systems and had evolved for that purpose—it was unlikely that researchers instilled such behavior entirely de novo. (183)

Further to this point, Cerrone (2018) argues that the conceptions of language on which human-animal language studies have been based have relied on a "highly artificial sign system that contains nothing more than formal components of human language" (42), and have promulgated symbolism as a property of human language alone. Cerrone (2018) is not alone in critiquing the conceptual and practical bases of interspecies language studies. According to Johansson (2015), in a paper theorising Neanderthal language (including whether it should be classified as 'language' or not), the notion "[t]hat language is monolithic, and that its biological underpinnings are fixed and invariable in the species" is problematic from "general evolvability considerations" as well as empirical studies on variation amongst homo sapiens (313). It seems the question of *what language is* is a necessary first step to defining who *uses language* or who *languages*.

The field of biosemiosis, which theorises the use of signs amongst living beings (Lyons 2019), is highly relevant to a posthumanist applied linguistics. Biosemiotics is concerned with *signs* across nature (Sebeok, 2010). As a point of clarification, biosemiotic work extends beyond animals per se–for instance, Faltýnek and Lacková (2021) explore proteins as a form of *protosemiosis.* Biosemiotics is about *life*, as broadly as possible:

> Life is not just about molecules, but also about signs, signs that are at play in the biochemical make-up of slime-mold, in the orientation of leaves and branches, in the flight patterns of birds, in the language development of humans. Because life is perfused with signs, organisms are actual subjects (not machines), they have experiences (they are not involved in simple exchanges of data), they are said to learn and adapt (they are not driven by some vague explanatory principle like instinct), they evolve with their environment (and cannot exist torn, abstracted from the world). (Hope 2017, 397-398)

Although biosemiosis has been positioned as more a scientific discipline than a philosophical pursuit, there is potential for productive transfer of its canon to critique human exceptionalism in fields such as applied linguistics and the humanities, drawing across disciplines for support. On this basis, taking up Ferrando's (2016a) axiom that *humans have always been posthuman*, we may assert that language has always been more-than-human. To the question 'can nonhumans speak?' we answer in the affirmative: the nonhuman have always spoken (it is

perhaps 'us' that have not had the tools, perception, or will, to recognise this).

To provide a simple example: while the ability to use language in particular ways has provided a pillar to distinguish homo sapiens from other living animals (Gamble 2011), studies of Neanderthals (*homo neanderthalensis*) have problematised the adscription of language to homo sapiens only (Dediu, Levinson 2018; Gamble 2011; Johansson 2015), while also underscoring the importance of communication and meaning-making *in situ*. Although Neanderthals are not considered radically different from homo sapiens, the expansion of comparable language practices (Dediu, Levinson 2018) beyond the Anthropos proper suggests a different possible model for language development, which is the 'gradualist view', and not one which evolved for homo sapiens alone. The reason for discussing the gradualist view here is to resist holding homo sapiens apart as the only species with access to 'language'; a gradual development of human language practices suggests a spectrum of semiotic practices that existed at each stage, rather than a sudden change from nonhuman to human behaviour. It also reminds us that gradual development is still occurring – not in a linear direction, but in line with social, contextual and biological factors.

The gradualist view of human language development argues against an evolutionary saltation – or a leap – in which the capacity for human language systems, currently recognised, was quickly developed (Berwick, Chomsky 2016; Tallerman 2014). Dediu and Levinson (2018) argue for a "much deeper antiquity and gradualism" (49) concerning the development of human language, as opposed to an abrupt language evolution. Accordingly, one of the clearest clues of the deep prehistory of language concerns the 'externalisation' of language and neural underpinnings (externalisation here meaning person-to-person use 'out-loud' rather than 'internal' monologue):

> [s]peech itself involves over 100 muscles and complex anatomical structures that require coordination and planning at the ten-milliseconds and millimeter scales, and the evolution of specialized neural connections to the tongue, the larynx and the intercostal muscles, the extension of the arcuate fasciculus and the development of other neural circuits. (Dediu, Levinson 2018, 53)

Similarly, Tallerman (2014) refutes saltationism on the basis that lexicons and syntaxes are subject to incremental growth and development, and that both developed gradually via hominin cognitive and linguistic evolution. An appreciation of the deep timescales of language practices, and recognition of their heterogeneity, remind us to take a nuanced approach. As ontologically oriented work within and beyond anthropology mobilises situated and relational approaches to world-making (Demuro, Gurney 2021), so too may a posthumanist applied linguistics step back from linguistic universals to apprehend language, tied up in meaning making, as a situated and relational endeavour tied to agency.

To think through this further, we now turn to two models, both drawn from the natural sciences, which may prove productive in reconceptualising language(s)/languaging amongst both humans and other-than-humans through a posthumanist framing. These are Uexküll's *Umwelt* and Maturana and Varela's *languaging*.

MULTIPLE ONTOLOGIES: UMWELT, LANGUAGING, AND WORLDS

Anthropologist Viveiros de Castro (1998), who specialises in ontological work focusing on Amazonian peoples, has reasoned that the distinctions between humans and other animals (and spirits) stem, at least in part, from our incapacity to see in other beings, their practices and systems, correlations to our own realities. The realities referred to here are those of modernity, and the clean cuts made between humans and others. However, this is not an inevitability. For example, he writes that, via Amazonian perspectivism, this need not be the case:

> […] animals and spirits see themselves as humans: they perceive themselves as (or become) anthropomorphic beings when they are in their own houses or villages and they experience their own habits and characteristics in the form of culture –they see their food as human food (jaguars see blood as manioc beer, vultures see the maggots in rotting meat as grilled fish, etc.), they see their bodily attributes (fur, feathers, claws, beaks etc.) as body decorations or cultural instruments, they see their social system as organized in the same way as human institutions are (with chiefs, shamans, ceremonies, exogamous moieties, etc.). (Viveiros de Castro 1998, 470)

In relation to this cosmology, animal-worlds (ontologies) and human-worlds (ontologies) may be seen as correlatives. Returning to the earlier discussion concerning ontology as storied performativity, the point here is *not* to assess the supposed veracity of these assertions; rather, we are interested in how they help us to understand the realities inhabited by humans and others. In other words, how do they make sense of the worlds they inhabit? What is real *to them?* And how do they see language and communication – however defined – as part of these worlds?

To build on the discussion that Viveiros de Castro (1998) poses, this section examines whether an interrogation of language ontologies—as world-making practices—can apprehend language(s)/languaging *beyond* humans. That is, how can we conceptualise the language practices of nonhuman others? *Umwelt* provides a multi-species model for comprehending the world. In a similar vein to anthropology's ontological turn but deliberately extended beyond humanity, Umwelt encompasses realities and the processes of making meaning within them

as multiple, situated, and potentially incomprehensible to those who have no access to them.

The theory of Umwelt (dwelling-world), or *Umweltlehre* (the study of dwelling-worlds), was developed by Jakob Johann von Uexküll (1864-1944), a biologist, zoologist and physicist who investigated signs and meaning-making processes, and has had significant impact on the field of biosemiotics (Sebeok, 2010). Augustyn (2018) provides the following translation of Uexküll (1902): "[no] matter how certain we are of the reality that surrounds us, *it only exists in our capacities to perceive it*. That is the threshold we have to cross before we can go any further" (emphasis added, 122). A contribution of Uexküll's Umwelt is that it introduces situated subjectivity into studies of nonhuman animals, moving meaning-making beyond behaviourist stimulus-response models. In other words, rather than animal communication constituting an uncontrolled or conditioned response to stimuli in their environments, assumptions concerning what the environments themselves *are* are reconfigured to constitute completely different sets of semiotic signs and potentialities to those who inhabit them: "living beings are enmeshed in worlds of meaningful, significant phenomena and occurrences" (Tønnessen 2015, 80). As illustration,

> [t]here is no *forest* as a firmly objectively determined environment, but rather, there is only a forester-, hunter-, botanist-, stroller-, nature-lover–, lumberjack-, berry-collector–, and a fairy-tale– forest, in which Hänsel and Gretel get lost." *The meaning of the forest is multiplied a thousandfold if one does not limit oneself to its relations to human subjects but also includes animals.* (emphasis added, Uexküll 2010, 142)

Humans also inhabit Umwelten (Cobley 2016). From a biological standpoint, we have shared senses that contribute to how we experience the world. However, part of our argument is that how we use these to *make sense* of the world differs (as has been discussed above in relation to ontology and practice). Meaning-making subjects may ascribe meaning to any entity, organism, process, and so on, according to how it fits into their world. Uexküll (2010) notes that: "[a]ll animal subjects, from the simplest to the most complex, are inserted into their environments to the same degree of perfection. The simple animal has a simple environment, the multiform animal has an environment just as richly articulated as it is" (50). A flower stem, for instance, may serve as a decoration for a human, a pathway to food for an ant, food for a cow, and so forth (Uexküll 2010). One can perceive how the notion of Umwelt may come into dialogue with posthumanist thinking, particularly in relation to the desire to relate to others *on their own terms*.[10]

Biologists Humberto Maturana and Francisco Varela provide complementary ideas to think through language beyond humans, although not necessarily within the field of biosemiotics. In their highly influential book *The tree of knowledge (El árbol del conocimiento)*, Maturana and Varela (1987) present a biological entry point into cognition, knowledge, and social and cultural phenomena amongst humans and other species. They explore the ways in which interactions with and experiences of the world are inextricably located within biological structures, focusing particularly on the workings of the nervous system. Putting aside "our daily tendency to treat our experience with the seal of certainty, as though it reflected an absolute world" (25), they begin the book with the statements that "every act of knowing brings forth a *world*" (emphasis added, 26) and "all doing is knowing, all knowing is doing" (26). There are clear parallels here with the ontological premise of *worlding* as a practice that brings particular worlds into existence. Furthermore, their work responds to the assertion that everything that is said is said by *someone*.

Maturana and Varela (1987) are aware of the implications of relocating and binding knowledge of the world to the structural limitations and affordances of organisms. Fundamentally, this stance questions the relationship between cognitive phenomena (what is thought, what is known) and external phenomena (what exists beyond the body). They identify two 'traps' inherent to popular approaches: the first is "assuming that the nervous system operates with representations of the world" and the second is "denying the surrounding environment on the assumption that the nervous system functions completely in a vacuum, where everything is valid and everything is possible" (133–134). Both traps represent distant points on a spectrum, from extreme objectivism to radical solipsism; where one end permits only knowledge of the self (solipsism), the other essentially ignores the self in establishing knowledge of the world (objectivism). The solution to these limited accounts rests, they argue, somewhere in the middle. Their key assertion – that everything said is said by someone – is an organising principle, as is understanding and acknowledging the operation of the nervous system.

Social and cultural interactions take place as a phenomenological domain where organisms interact in repeated and sustained ways (couplings), giving rise to such phenomena as language. However, this domain is not restricted to humans: "once organisms with a nervous system arise, if the organisms take part in recurrent interactions, these couplings will occur" (181). These are, of course, dynamic processes and occur in different forms; the diversity "rests on the immense diversity of the behavioral couplings afforded by the nervous system" (Maturana, Varela 1987, 184).

Language belongs to—arises from and modulates—this social domain. Maturana (1970) and Maturana and Varela (1987) argue that language allows for the ongoing coordination of action, which develops as members of a social system live together. As a brief definition, they summarise language as follows: "[w]e operate in language when an observer sees that the objects of our linguistic distinctions are elements of our linguistic domain. Language is *an ongoing process that only exists*

as languaging, not as isolated items of behaviour" (emphasis added, Maturana, Varela 1987, 210). Further, Mignolo (cited in Delgado, Romero 2000) provides a neat summary of *languaging* among nonhumans:

> to understand the concept of languaging it is necessary, first, to understand language beyond "human" languages in the way it has been conceptualized in Western scholarship through the philosophy of language, since Plato, and by the tradition that Noam Chomsky identified as "cartesian linguistics." Language in Maturana's and Varela's argument is any type of inter-action between living organisms, and not only human living organisms. Put this upside down and what you have is that "human languages" are just a small part and a particular type of interaction among living organisms, different, for instance, from the language of the "flora" and the "fauna". (16)[11]

To unpack Maturana and Varela's (1987) concept, we need to understand their assertion that language was never invented to 'take in' an outside world only; rather, by the act of languaging – with the behavioural coordination that this act implies, where individuals coordinate their actions through shared items in the linguistic domain, i.e., words, noises, gestures – we bring forth worlds.[12] Subsequently, in languaging, we find ourselves "in an ongoing transformation in the becoming of the linguistic world that we build with other human beings" (Maturana, Varela 1987, 234–235).[13] Despite the importance of language to human social cohesion, languaging is not restricted to humans alone. Indeed, Maturana and Varela (1987) draw on studies involving primates and sign language, arguing that these studies give evidence of these animals' languaging practices. Maturana and Varela (1987) further argue that the extent to which these animals are able to enter into human languaging is of course limited by their physical functioning/nervous systems (i.e., the ability to speak). Cuffari, Di Paolo, and De Jaegher (2015) build on their work and present languaging as 'adaptive social sense-making':

> Being a linguistic sense-maker is not (only) about producing or comprehending texts or verbal utterances. It is more than this, not only because language is 'multimodal', but because languaging is an activity of a signifying and sensitive agent who copes, acts, lives and has its being in a domain constituted by wordings, histories, rules, authorities, articulations, interactions, other people, and the work of other people (Cuffari et al. 2015, 1092). Linguistic sense-makers are those who negotiate interactive and internalized ways of metaregulating the moment-to-moment activities of living and cognizing. (emphasis added, 1089).

Umwelt and languaging, as discussed here, both speak to ontologies beyond the human and offer possible models for worlding language(s)/languaging. These accounts provide entry-points into nonhuman worlds and ontologies. Uexküll emphasises *situated subjectivities* and the existence of worlds which (as human observers) we may not (or rather, do not) have access to. Meanwhile, via Maturana and Varela, the concept of languaging emphasises interaction between organisms within and beyond the Anthropos. Read in dialogue with the ontological turn, Umwelt and languaging provide steps to conceptualise meaning making within particular worlds as instances of language(s)/languaging amongst humans and nonhumans.

CONCLUSION

This paper began with a brief discussion of posthumanism, oriented around two axes of critique: the supposed universality of the human and the centrality of the Anthropos. Using the first axis of the posthumanist critique, the argument interrogated the linguistic universalism of human language and the corresponding idea that language can be defined in a conclusive and singular account—that is, language is not *one* thing at all. To represent this, we use the term language(s)/languaging. With respect to the second axis, which pertains to the extension beyond the Anthropos, the paper has argued that language(s)/languaging is not restricted to humans alone. To explore this point, we synthesised work from the ontological turn with scholarship emerging from biology and biosemiotics. We argue that interdisciplinary work is a productive starting point which can respond to Braidotti's (2019b) call for the humanities and sciences to rework their relationship, "thus allowing for a culture of mutual respect to emerge" (1184).[14]

Research in posthumanist linguistics, however, is not restricted to the biological. There is potential in the exploration of ontologies of language deriving from the practices of *other* nonhumans. In this direction, an expanded account of posthumanist linguistics may consider these matters in relation to other languaging practices, such as technologically mediated language(s)/languaging. The posthuman is also technological, and technology has a key role to play in ontologising language; this is not only in terms of reproducing, translating, transcribing and teaching human languages, but also potentially in redirecting the evolution of human language practices and possibly forming fields of language which exclude humans altogether.

As the posthumanist turn is just beginning to make strides in applied linguistics, there is considerable scope for further research. Paraphrasing from Wallin (2013, 12), we pose the following questions related to language in a posthuman frame: What would it mean to rethink language(s)/languaging as a process capable of dilating ontology *beyond the human*? What faulty premise (or premises) does the reification of the human as an

essentialised category rely upon in order to maintain itself, and how might language(s)/languaging be complicit in this reification? In what ways do language(s)/languaging require re-politicisation in order for us to think alongside nonhuman life? Moving forward, such questions may give shape to what we are able to imagine in the space of posthumanist applied linguistics, and how we may conceptualise language(s)/languaging in the future.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

REFERENCES

Affifi, R., 2013. Learning plants: Semiosis between the parts and the whole. *Biosemiotics, 6*(3), 547–559. available at: < https://doi.org/10.1007/s12304-013-9164-x >.

Appleby, R., Pennycook, A., 2017. Swimming with sharks, ecological feminism and posthuman language politics. *Critical Inquiry in Language Studies, 14*(2), 239–261. available at: < https://doi.org/10.1080/15427587.2017.1279545 >.

Augustyn, P., 2018. Animal studies in the language sciences. *Biosemiotics, 11*(1), 121–138. available at: < https://doi.org/10.1007/s12304-018-9313-3 >.

Barad, K., 2003. Posthumanist performativity: Toward an understanding of how matter comes to matter. *Signs: Journal of Women in Culture and Society, 28*(3), 801–831. available at: < https://doi.org/10.1086/345321 >.

Becker, A. L., 1991. Language and languaging. *Language & Communication, 11*, 33–35.

Berwick, R. C., Chomsky, N., 2016. *Why only us. Language and evolution*. MIT Press.

Blaser, M., 2009. Political ontology. *Cultural Studies, 23*(5–6), 873–896. available at: < https://doi.org/10.1080/09502380903208023 >.

Blaser, M., 2013. Ontological conflicts and the stories of peoples in spite of Europe: Toward a conversation on political ontology. *Current Anthropology, 54*(5), 547–568. available at: < https://doi.org/10.1086/672270 >.

Blaser, M., 2016. Is another cosmopolitics possible? *Cultural Anthropology, 31*(4), 545–570, available at: < https://doi.org/10.14506/ca31.4.05 >.

Bloome, D., Beauchemin, F., 2016. Languaging everyday life in classrooms. *Literacy Research: Theory, Method, and Practice, 65*(1), 152–165. available at: < https://doi.org/10.1177/2381336916661533 >.

Braidotti, R., 2006. Posthuman, all too human: Towards a new process ontology. *Theory, Culture & Society, 23*(7–8), 197–208. available at: < https://doi.org/10.1177/0263276406069232 >.

Braidotti, R., 2013. *The posthuman*. Polity Press.

Braidotti, R., 2019a. A theoretical framework for the critical posthumanities. *Theory, Culture & Society, 36*(6), 31–61. available at: < https://doi.org/10.1177/0263276418771486 >.

Braidotti, R., 2019b. Transversal posthumanities. *Philosophy Today, 63*(4), 1181–1195. available at: < https://doi.org/10.5840/philtoday2020128318 >.

Callus, I., Herbrechter, S., 2012. Introduction: Posthumanist subjectivities, or, coming after the subject. *Subjectivity, 5*(3), 241–264. available at: < https://doi.org/10.1057/sub.2012.17 >.

Canagarajah, A. S., 2006. After disinvention: Possibilities for communication, community and competence. In Makoni, S., Pennycook, A. (Eds.), *Disinventing and reconstituting languages*. Multilingual Matters, pp. 233–239.

Carrithers, M., Candea, M., Sykes, K. et al., 2010. Ontology is just another word for culture: Motion tabled at the 2008 Meeting of the Group for Debates in Anthropological Theory. *Critique of Anthropology, 30*, 152–200, available at: < https://doi.org/10.1177/0308275X09364070 >.

Cerrone, M., 2018. Umwelt and ape language experiments: On the role of iconicity in the human-ape pidgin language. *Biosemiotics, 11*(1), 41–63. available at: < https://doi.org/10.1007/s12304-018-9312-4 >.

Chernela, J., 2018. Language in an ontological register: Embodied speech in the Northwest Amazon of Colombia and Brazil. *Language & Communication, 63*, 23–32. available at: < https://doi.org/10.1016/j.langcom.2018.02.006 >.

Cobley, P., 2016. *Cultural implications of biosemiotics*. Springer.

Copson, A., 2015. What is humanism? In Copson, A., Grayling, A. C. (Eds.), *The Wiley Blackwell handbook of humanism*. Wiley Blackwell, pp. 1–34.

Cornips, L., van den Hengel, L., 2021. Place-making by cows in an intensive dairy farm: A sociolinguistic approach to nonhuman animal agency. In Bovenkerk, B., Keulartz, J. (Eds.), *Animals in our midst: The challenges of co-existing with animals in the anthropocene*. pp. 177–202.

Cuffari, E. C., Di Paolo, E., De Jaegher, H., 2015. From participatory sense-making to language: There and back again. *Phenomenology and the Cognitive Sciences, 14*(4), 1089–1125. available at: < https://doi.org/10.1007/s11097-014-9404-9 >.

de la Cadena, M., Blaser, M. (Eds.), 2018. *A world of many worlds*. Duke University Press.

Dediu, D., Levinson, S. C., 2018. Neanderthal language revisited: Not only us. *Current Opinions in Behavioral Sciences, 21*, 49–55. available at: < https://doi.org/10.1016/j.cobeha.2018.01.001 >.

Deely, J., 2015. Building a scaffod: Semiosis in nature and culture. *Biosemiotics, 8*, 341–360. available at: < https://doi.org/10.1007/s12304-015-9237-0 >.

Deleuze, G., Guattari, F., 1987. *A thousand plateaus: Capitalism and schizophrenia* (B. Massumi, Trans.). Continuum.

Delgado, L. E., Romero, R. J., 2000. Local histories and global designs: An interview with Walter Mignolo.

Discourse, 22, 7–33. available at: < https://doi.org/10.1353/dis.2000.0004 >.

Demuro, E., Gurney, L., 2021. Languages/languaging as world-making: The ontological bases of language. *Language Sciences, 83*, 1–13, available at: < https://doi.org/10.1016/j.langsci.2020.101307 >.

Errington, J., 1999. Ideology. *Journal of Linguistic Anthropology, 9*(1–2), 115–117. available at: < https://doi.org/10.1525/jlin.1999.9.1-2.115 >.

Escobar, A., 2016. Thinking-feeling with the Earth: Territorial struggles and the ontological dimension of the epistemologies of the south. *Revista de Antropología Iberoamericana, 11*(1), 11–32. available at: < https://doi.org/10.11156/aibr.110102e >.

Evans, N., Levinson, S. C., 2009. The myth of language universals: Language diversity and its importance for cognitive science. *Behavioral and Brain Sciences, 32*(5), 429–448. available at: < https://doi.org/10.1017/S0140525X0999094X >.

Faltýnek, D., Lacková, L., 2021. In the case of protosemiosis: Indexicality vs. iconicity of proteins. *Biosemiotics, 14*(1), 209–226.

Ferrando, F., 2013. Posthumanism, transhumanism, antihumanism, metahumanism, and new materialisms. *Existenz, 8*(2), 26–32.

Ferrando, F., 2016a. Humans have always been posthuman: A spiritual geneaology of posthumanism. In Banerji, D., Paranjape, M. R. (Eds.), *Critical posthumanism and planetary futures*. Springer, pp. 243–256.

Ferrando, F., 2016b. The Party of the anthropocene: Post-humanism, environmentalism and the post-anthropocentric paradigm shift. *Relations: Beyond anthropocentrism, 4*(2), 160–173.

Gamble, C., 2011. The social and material life of Neanderthals. In Conard, N. J., Richter, J. (Eds.), *Neanderthal lifeways, subsistence and technology: One hundred fifty years of Neanderthal study*. Springer, pp. 157–166.

Gaylard, R., 2004. "Welcome to the world of our humanity": (African) humanism, ubuntu and black South African writing. *Journal of Literary Studies, 20*(3–4), 265–282. available at: < https://doi.org/10.1080/02564710408530357 >.

Guimarães, S. W. F., Silva, H. P., 2020. What have the revelations about Neanderthal DNA revealed about Homo sapiens? *Anthropological Review, 83*(1), 93–107. available at: < https://doi.org/10.2478/anre-2020-0008 >.

Gurney, L., & Demuro, E., 2022. Tracing new ground, from language to languaging, and from languaging to assemblages: Rethinking languaging through the multilingual and ontological turns. *International Journal of Multilingualism, 19*(3), 305–324. available at: < https://doi.org/10.1080/14790718.2019.1689982 >.

Hauck, J. D., Heurich, G. O., 2018. Language in the Amerindian imagination: An inquiry into linguistic natures. *Language & Communication, 63*, 1–8. available at: < https://doi.org/10.1016/j.langcom.2018.03.005 >.

Henare, A., Holbraad, M., Wastell, S., 2007. Introduction: Thinking through things. In Henare, A., Holbraad, M., Wastell, S. (Eds.), *Thinking through things: Theorising artefacts ethnographically*.: Routledge, pp. 1–31.

Heywood, P., 2017. The ontological turn. *Cambridge encyclopedia of anthropology,* available at: < http://www.anthroencyclopedia.com/entry/ontological-turn#h2ref-1 >.

Holbraad, M., 2020. The shapes of relations: Anthropology as conceptual morphology. *Philosophy of the Social Sciences, 50*(6), 495–522, available at: < doi:10.1177/0048393120917917 >.

Holbraad, M., Pedersen, M. A., 2017. *The ontological turn*. Cambridge University Press.

Hope, J., 2017. Various shapes of cultural biosemiotics. *Biosemiotics, 10*(3), 397–411.

Johansson, S., 2015. Language abilities in Neanderthals. *Annual Review of Linguistics, 1*(1), 311–332, available at: < https://doi.org/10.1146/annurev-linguist-030514-124945 >.

Kohn, E., 2015. Anthropology of ontologies. *Annual Review of Anthropology, 44*, 311–327. available at: < https://doi.org/10.1146/annurev-anthro-102214-014127 >.

Kubota, R., Miller, E. R., 2017. Re-examining and re-envisioning criticality in language studies: Theories and praxis. *Critical Inquiry in Language Studies, 14*(2–3), 129–157. available at: < https://doi.org/10.1080/15427587.2017.1290500 >.

Lee, Y. T., 2003. Daoistic humanism in ancient China: Broadening personality and counseling theories in the 21st century. *Journal of Humanistic Psychology, 43*(1), 64–85.

Letiche, H., 2017. Bewildering pedagogy. *Journal of Curriculum and Pedagogy, 14*(3), 236–255. available at: < https://doi.org/10.1080/15505170.2017.1335662 >.

Levinson, S. C., Evans, N., 2010. Time for a sea-change in linguistics: Response to comments on 'The myth of language universals'. *Lingua, 120*(12), 2733–2758. available at: < https://doi.org/10.1016/j.lingua.2010.08.001 >.

Lewis, G., Jones, B., Baker, C., 2012. Translanguaging: Developing its conceptualisation and contextualisation. *Educational Research and Evaluation, 18*(7), 655–670. available at: < https://doi.org/10.1080/13803611.2012.718490 >.

Lewis, S. L., Maslin, M. A., 2015. Defining the anthropocene. *Nature, 519*(7542), 171–180. available at: < https://doi.org/10.1038/nature14258 >.

Li, W., 2018. Translanguaging as a practical theory of language. *Applied Linguistics, 39*(1), 9–30, available at: < http://dx.doi.org/10.1093/applin/amx039 >.

Love, N., 2004. Cognition and the language myth. *Language Sciences, 26*(6), 525–544. available at: < https://doi.org/10.1016/j.langsci.2004.09.003 >.

Lyons, N., 2019. *Signs in the dust: A theory of natural culture and cultural nature*. Oxford University Press.

Makoni, S., Pennycook, A., 2006. Disinventing and reconstituting languages. In Makoni, S., Pennycook, A. (Eds.), *Disinventing and reconstituting languages*. Multilingual Matters, pp. 1–41.

Maturana, H. R., 1970. *Biology of cognition*. BCL Report # 9.0. University of Illinois.

Maturana, H. R., Varela, F. J., 1987. *The tree of knowledge: The biological roots of human understanding (revised edition)* (R. Paolucci, Trans.). Shambhala Publications, Inc.

Orman, J., 2013. New lingualisms, same old codes. *Language Sciences, 37*, 90–98. available at: < https://doi.org/10.1016/j.langsci.2012.12.001 >.

Pedersen, M., 2012. Common Nonsense: A Review of Recent Reviews of the 'Ontological Turn'. *Anthropology of this Century, 5*. available at: < http://aotcpress.com/articles/common_nonsense/ >.

Pennycook, A., 2018a. Posthumanist applied linguistics. *Applied Linguistics, 39*(4), 445–461. available at: < https://doi.org/10.1093/applin/amw016 >.

Pennycook, A., 2018b. *Posthumanist applied linguistics*. Routledge.

Pepperberg, I. M., 2017. Animal language studies: What happened? *Psychonomic Bulletin & Review, 24*(1), 181–185. available at: < https://doi.org/10.3758/s13423-016-1101-y >.

Peters, M. A., 2015. The humanist bias in Western philosophy and education. *Educational Philosophy and Theory, 47*(11), 1128–1135. available at: < https://doi.org/10.1080/00131857.2014.991497 >.

Ryan, J. C., 2020. Writing the lives of plants: Phytography and the botanical imagination. *a/b: Auto/Biography Studies, 35*(1), 97–122. available at: < https://doi.org/10.1080/08989575.2020.1720181 >.

Sebeok, T., 2010. Biosemiotics: Its roots, proliferation and prospects. In Favareau, D. (Ed.), *Essential readings in biosemiotics: Anthology and commentary*. Springer, pp. 217–236.

Steffen, W., Broadgate, W., Deutsch, L. et al., 2015. The trajectory of the Anthropocene: The great acceleration. *The Anthropocene Review, 2*(1), 81–98. available at: < https://doi.org/10.1177/2053019614564785 >.

Steffen, W., Crutzen, P. J., McNeill, J. R., 2007. The Anthropocene: Are humans now overwhelming the great forces of nature? *AMBIO: A Journal of the Human Environment, 36*(8), 614–621. available at: < https://doi.org/10.1579/0044-7447(2007)36[614:TAAHNO]2.0.CO;2 >.

Steffen, W., Rockström J., Richardson, K. et al., 2018. Trajectories of the Earth System in the Anthropocene. *Proceedings of the National Academy of Sciences, 115*, 8252–8259, available at: < https://doi.org/10.1073/pnas.1810141115 >.

Tallerman, M., 2014. No syntax saltation in language evolution. *Language Sciences, 46*, 207–219. available at: < https://doi.org/10.1016/j.langsci.2014.08.002 >.

Thibault, P. J., 2017. The reflexivity of human languaging and Nigel Love's two orders of language. *Language Sciences, 61*, 74–85. available at: < https://doi.org/10.1016/j.langsci.2016.09.014 >.

Tønnessen, M., 2015. Umwelt and language. In Velmezova, E., Kull, K., Cowley, S. J. (Eds.), *Biosemiotic perspectives on language and linguistics*. Springer, pp. 77–96.

Uexküll, J., 2010. *Foray into the worlds of animals and humans: With a theory of meaning*. University of Minnesota Press.

Vitousek, P. M., Mooney, H. A., Lubchenco, J. et al., 1997. Human domination of Earth's ecosystems. *Science, 277*(5325), 494–499. available at: < https://doi.org/10.1126/science.277.5325.494 >.

Viveiros de Castro, E., 1998. Cosmological deixis and Amerindian perspectivism. *Journal of the Royal Anthropological Institute, 4*(3), 469–488. available at: < https://doi.org/10.2307/3034157 >.

Viveiros de Castro, E., 2004. Exchanging perspectives: The transformation of objects into subjects in Amerindian ontologies. *Common Knowledge, 10*(3), 463–484. available at: < https://doi.org/10.1215/0961754X-7299066 >.

Viveiros de Castro, E., 2015. Who Is Afraid of the Ontological Wolf? *The Cambridge Journal of Anthropology, 33*(1), 2, available at: < https://doi.org/10.3167/ca.2015.330102 >.

Wallin, J., 2013. One hundred trillion anomals take the stand. *Journal of Curriculum and Pedagogy, 10*(1), 11–13, available at: < https://doi.org/10.1080/15505170.2013.789993 >.

Wolfendale, P., 2019. The reformatting of Homo Sapiens. *Angelaki, 24*(1), 55–66.

Woolard, K. A., Schieffelin, B. B., 1994. Language ideology. *Annual Review of Anthropology, 23*, 55–82. available at: < https://doi.org/10.1146/annurev.an.23.100194.000415 >.

ENDNOTES

1 We use 'human' here to refer to the only extant species of the homo genus, *homo sapiens*, although we note that the division between species can be blurry (Guimarães, Silva 2020). As we explore in the paper, the term human has also been caught up with the universalisation of practices of certain members of the homo sapiens group.

2 Humanism, however, it is not exclusive to the West (as argued, for instance, by Gaylard 2004; Lee 2003), and it is a rather heterogeneous project.

3 Core tenets of humanism include the use of human senses as a way to gain knowledge (establishing empirically the truth of existence); naturalism –i.e. belief in the observable and describable natural world, as opposed to the intangible, mysterious and inaccessible supernatural; the importance of free and scientific inquiry, underpinned by the scientific method, precluding "assent to propositions that rely solely on inherited dogma, claims of revelation, or arguments from personal and un-replicable experience" (Copson 2015, 8); and the valuing of truth (Copson 2015).

4 For Letiche (2017), humanism cannot be easily summarised, stating that "[it] is not synonymous with the denial of animality and/or the hierarchization of life forms with Man on the top. Disregard for the environment, or unbridled exploitation of natural resources, or anthro-centricism is not a humanist project" (252).

5 This is discussed by Pennycook (2018a), who argues that, "[t]he humanist beliefs in self-determination and transparency – the beliefs that humans control their destiny and their minds, the beliefs that bourgeois self-reliance, moral probity and rational thought would provide goods for all – were progressively undermined by Darwin, Marx, Freud, Foucault and many others: it turned out that humans are in fact very closely related to monkeys and other animals, the products rather than the instigators of market forces, not nearly as much in control of ourselves as we'd hoped, a product in any case of a particular episteme, and subject to rather delusional ideas about universal thought, knowledge and humanity" (22).

6 "Women's, gay and lesbian, gender, feminist and queer studies, race, postcolonial and subaltern studies, alongside cultural studies, film, television and media studies, and science and technology studies are the prototypes of the first generation of studies. They constitute the radical epistemologies that have voiced the insights and knowledge of the structural "others" of the humanistic "Man of reason" (Lloyd 1984) and have carried them into trans-disciplinary forms of knowledge production. But, as I will go on to ague next, their anthropocentrism is so intrinsic as to remain unthought-of and therefore under-examined" (Braidotti 2019a, 1182–1183).

7 Braidotti (2013) summarises this dual agenda:
"Universal 'Man', in fact, is implicitly assumed to be masculine, white, urbanized, speaking a standard language, heterosexually inscribed in a reproductive unit and a full citizen of a recognized polity (Irigaray, 1985b; Deleuze and Guattari, 1987). How nonrepresentative can you get? As if this line of criticism were not enough, this 'Man' is also called to task and brought back to its species specificity as *anthropos* (Rabinow, 2003; Esposito, 2008), that is to say as the representative of a hierarchical, hegemonic and generally violent species whose centrality is now challenged by a combination of scientific advances and global economic concerns" (65).

8 Vitousek et al. (1997) stated over 20 years ago that "[w]e live on a human-dominated planet— and the momentum of human population growth, together with the imperative for further economic development in most of the world, ensures that our dominance will increase […] In a very real sense, the world is in our hands" (198–199).

9 Holbraad argues that ontology is "the result of anthropologists' systematic attempts to transform their conceptual repertoires in such a way as to be able to describe their ethnographic material in terms that are not absurd" (as cited in Carrithers et al. 2010, 185).

10 A recent example is provided by Cornips and van den Hengel (2021), who take a sociolinguistic approach to explore symbolic meaning embedded within places as material assemblages, focusing on cows in dairy farms. While not explicitly drawing on Umwelt, parallels can be seen in terms of how the researchers attempt to understand place-making amongst cows, who live within 'sociolinguistic communities of practice', and how the cows' worlds come into contact with the human worlds of dairy farming. To use Sebeok's (2010, 228) nomenclature, these are semiospheres within biospheres.

11 Mignolo (cited in Delgado & Romero, 2000) further states that "there is something particular to living organisms we call "human", and that particularity is that "human living organisms" can be observers of domains of interactions

among living organisms, are able to describe those behaviors, and furthermore, to observe themselves observing other organisms" (16).

12 It is important here to distinguish the use of *languaging* in Maturana and Varela (1987), and its use by scholars of the multilingual turn. Maturana and Varela are discussing language as a practice that extends beyond the human to other living organisms. Languaging (and the associated term *translanguaging*) within the multilingual turn seems to have lost this dimension, but it has retained the idea of language as an action or a verb (and in the case of translanguaging, as the act of being in two or more languages). See, for example, Becker (1991), Bloome and Beauchemin (2016), G. Lewis et al. (2012), Thibault (2017) and Wei (2018).

13 Languaging, for Maturana and Varela (1987), is at the core of social cohesion. In the same way that insects maintain social cohesion through trophallaxis, human social unity is based on "linguallaxis", a "linguistic domain constituted as a domain of ontogenic coordinations of actions. We human beings are human beings only in language" (211–212). Similarly, Tønnessen (2015) locates human language as internal to human *Umwelten*: "[l]anguage, then, is intimately tied to perception – language frames perception, and simultaneously language is grounded in (core) perception – and, indeed, in a sense language is perception (as scholars within ecological linguistics freely admit, language is a perception system)" (80).

14 Once the demarcated lines between linguistics and semiosis are problematised, the field opens up to consideration of language in different ways, with varied histories and characteristics. Furthermore, cross-pollination between language studies and such fields as animal communication and archaeological anthropology may be productive.