

Animal performances

An exploration of intersections between feminist science studies and studies of human/animal relationships



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Abstract Feminist science studies have given scant regard to non-human animals. In this paper, we argue that it is important for feminist theory to address the complex relationships between humans and other animals, and the implications of these for feminism. We use the notion of performativity, particularly as it has been developed by Karen Barad, to explore the intersections of feminism and studies of the human/animal relationship. Performativity, we argue, helps to challenge the persistent dichotomy between human/culture and animals/nature. It emphasizes, moreover, how animality is a doing or becoming, not an essence; so, performativity allows us to think about the complexity of human/animal interrelating as a kind of choreography, a co-creation of behaviour. We illustrate the discussion using the example of the laboratory rat, who can be thought of both in terms of a materialization of specific scientific practices and as active participants in the creation of their own meaning, alongside the human participants in science. There are three, intertwined, senses in which we might think about performativity – that of animality, of humanness, *and of the relationship between the two*. Bringing animals into discussions about performativity poses questions for both feminist theory and for the study of human/animal relationships, we argue: both human and animal can conjointly be engaged in reconfiguring the world, and our theorizing must reflect that complexity. We are all matter, and we all matter.

keywords *animality and gender, human/animal relationship, laboratory rats, performativity*

Introduction

Non-human animals are both common and rare in feminist science studies. They are common in the sense that feminist analyses of science have necessarily paid attention to the biological sciences, which both use and define non-human species. But they are rare in the sense that feminist literature in general has paid scant regard to how we think about *animals* specifically (rather than as part of biology in general) or their place in relation to our theory.

Three decades ago, feminist work on science concentrated on women's health and on critiques of biological determinism. Among other things, this determinism typically relied on parallels drawn between stories of animals behaving in particular (instinctive) ways, and gender-stereotypic behaviour in humans. Repudiating these claims inevitably meant that feminists tended to avoid speaking about non-human animals, while emphasizing the social construction of gender, and human uniqueness. Meanwhile, the biological sciences have been a key focus for feminist science studies – the very areas of science which not only help to define what animals are, but also use non-human species extensively in the creation of biological knowledge. In that sense, then, animals have been central to how we have analysed science, yet covertly so.

Although a concern with animals and how we think about them is still relatively rare in feminist theory, they have now begun to enter the literature – admittedly, an entrance more at the pace of a tortoise than a hare (Birke, 2002). This emerging work, which theorizes intersections between feminist theory and animal studies, shows many reasons why feminists should pay attention to how we think about animals and animality, and how humans and non-humans act together in relationship. Animality is, for example, deeply intertwined with concepts of gender, race, or sexuality (Haraway, 1989; Birke, 1994; Bryld and Lykke, 2000). Moreover, 'animality' has long served as a foil to reflect what we consider to be human uniqueness; we often refer, for instance, to 'humans and animals' as though they are quite separate from us and quite homogeneous. That distinction, moreover, is reinforced by disciplinary segregation: sociology has traditionally studied humans and excluded other animals, while non-humans and their behaviour fall within the remit of biology. What is increasingly clear, however, is that animality itself (or, the specificity of any particular kind of animal) is just as complexly constructed as gender or humanness and so does not readily fall into disciplinary divides.

In this article, we will draw on our background as feminist science studies scholars and explore the intersections between feminist theory and studies of human/animal relationships. Like Karen Barad (2003), we find the concept of 'performativity' useful for analysing co- or intra-actions¹ of human and non-human actors, and we have thus begun to explore its relevance for the study of the human/animal interface, particularly within the discourses of the natural sciences, including those of popular science.² Among other things, we argue that performativity shifts the focus toward ideas of animal agency, and away from oppositional meanings of animal/human toward a more inclusive one.³

The article is structured in three main parts. In the first part, we draw parallels between the discourses of gender/sexuality and animality, introducing the idea of 'animating' to describe how we culturally produce the human/animal divide. We then introduce the concept of performativity, to challenge that division and to provide a fresh way of thinking about humans and animals. In the second part of the article we will illustrate these themes using laboratory rats as an example. In the third section, we ask how feminist theory and human/animal studies may enrich each other, theoretically, using the notion of performativity.

Performativity as nodal point between feminist theory and studies of human/animal relationships

Judith Butler (1990, 1993) developed the concept of performativity as a key approach to feminist theorizing of queer perspectives, but it can also be used to think about animals and animality, we argue. In Butler's theoretical work, performativity refers to the discursive practices through which human gender and sexuality are enacted in socio-cultural interaction. It indicates how gender as well as sexual identity, consequently, is something we *do* rather than innate and essential capacities that we have or are.

By contrast, in the natural sciences, non-human animals have typically been portrayed as beings characterized by innate behaviours, including behaviours determined by sexual difference. Sociality thus emerges incidentally, as a product of individual animals' instinctive responses. So, for example, 'gender differences' in non-human animals are almost always seen as the result of individual differences in something intrinsic (genes or hormones); they are very rarely seen as something created by social interaction. This, then, is quite different from how performativity has been used to theorize human gender, as a socio-cultural process. What seems to be missing, in our opinion, as a result of natural science's emphasis on sociality as product of inherent traits in animals, is much sense of non-human otherness as a *doing* or *becoming*, produced and reproduced in specific contexts of human/non-human interaction – which is where we think that the inspiration from Butler and, more recently, Barad (2003), can be particularly important.

To begin with Butler's work, with its emphasis on linguistic structures, she suggests that discourses of 'queering' act as founding moments of performativity (Butler, 1993); in an approximate analogy, we use the term 'animating'. Like the discursive regimes which produced the word 'queer', so those that enabled the word 'animal' in its specific sense of being oppositional to 'human' now reproduce power through different pejorative and inferiority-producing strategies. The noun 'queer' emerges from hegemonic discourse, which posits an essential dichotomy between a heterosexual norm and 'queer' deviancy. Analogously, the noun 'animal' is linked to a plethora of hegemonic discourses (philosophical, scientific, etc.), which rely on underlying assumptions about the essence or identity of 'animal' or 'human'. Their effect is to sustain the opposition of Human/cultural subject versus Animal/natural object. 'The Animal' in these essentializing discourses becomes that which is not Human (i.e. without subjectivity, without intentionality – a mere genetically programmed stimulus-reaction-machine: see discussion in Stibbe, 2001).

We suggest that the verbal form of the noun 'animal' – like the verbal form of 'queer' – can introduce a decisive break with the essentialism of the noun. 'Queering', notes Butler (1993), shifts the focus from an essence, other to the heterosexual norm, to a question of how 'queer' is performed and relates to socio-cultural power relations. Queer is no longer, in this perspective, an essence but a doing. Following a parallel line of thought, the notion of 'animating' can also shift perspective from animal essences to a study of the material-semiotic performativity of human/animal

relationships. Now, there are some differences between these terms. The word 'queer' does cultural work both for those inside and outside specific communities, marking borders for both. To make the word into a verb was a transgressive act precisely because it challenged those borders. Clearly non-human animals are not participants in the very human act of linguistically constructing boundaries, so animaling cannot work in direct analogy to queering across the human/animal boundary.

Linguistic boundaries, however, can be and are maintained by humans in relation to animals. If we shift the focus from groups of individuals, to relationships, we can focus on the human/animal as a kind of hybrid, that exists in the spaces between the two,⁴ and which – as a kind of hybrid – can maintain boundaries with other similar hybrids. Like queering, 'animaling' is a discursive process, operating between these human/animal conjunctions (thus no longer across the border of those who use speech and those who do not). For example, how the term 'animal' operates will differ between a human-and-guide-dog dyad, and (say) a human-trapping-rats dyad; the relationship between human and non-human is very different in each case. This could matter in the case of disputed politics, such as disagreements between antivivisectionists, opposed to use of any living animal in research, and those who seek legislative reform, for whom definitions of 'animals' may be contested.⁵ So, while it is an inexact analogy, we suggest that 'animaling' can also do border work between these conjoint human/non-humans, just as queering does.

Useful though we believe it is to use these ideas to challenge (human) cultural concepts of animality, our discussion so far has remained at the level of spoken language – by and large, the prerogative of humans. Barad (2003), however, begins her reworking of ideas of performativity by noting that, in recent theoretical work, 'Language has been granted too much power' (p. 801). Relatedly, even though we might seek to challenge the premises on which the concept 'animal' is founded, discussing only how the word is used still leaves non-human animals as rather passive participants in the creation of meaning.

Barad's work seeks to challenge much recent scholarship in which, she notes, '... matters of "fact" (so to speak) have been replaced with matters of signification (no scare quotes here). Language matters. Discourse matters. Culture matters. There is an important sense in which the only thing that does not seem to matter anymore is matter' (Barad, 2003: 801). In trying to move beyond representationalism (the belief that there are representations and things to be represented), she turns to what she calls 'agential realism', using performativity as a concept to move beyond the narrow confines of language. In this move, she refuses separation of observed object and observer, to emphasize instead *phenomena*. Of particular concern to us here, this development of performativity permits inclusion of the material, including animals.

We argue that the notion of performativity can equally be applied to thinking about the intimate choreography of human/animal interrelationships, following Barad's reformulation of the concept. Against this background, we will suggest that the notion of performativity can serve a useful

purpose in clarifying how human/animal relationships are co-constructed by discursive practices, to create emergent phenomena (the choreography, so to speak), and thus engaging both humans and non-humans in mutual intra-action.

With that in mind, we turn now to exploring a specific case study of animals in science; in our work, we have analysed several examples, such as the behaviour of insects in documentary films (Lykke and Bryld, 2003) and the behaviour of laboratory rats (Birke, 2003). Here, we use rats as an example – species with whom we also live closely (even if we would prefer not to acknowledge that proximity). But they have entered the laboratory in highly specific ways, engaging in the material development of ‘the laboratory rat’. This will bring us on to develop the idea of human/animal performativity more fully, in later sections.

Becoming rats: animals in scientific discourse and laboratory practices

Analysing scientific descriptions of animal behaviour over the past century, Eileen Crist (1999) notes how these have oscillated between two kinds of narrative. One, which she characterizes as internalistic, has historically typified naturalists’ writing (including Darwin’s): it emphasizes animals as active subjects, and gives a phenomenological description of the animal’s life world. It is, moreover, a style in which the observer is often present, writing about personal observations and interactions with the animals. The other style, characterized as externalistic, focuses on scientists’ efforts to objectify nature and to remove references to subjectivity.⁶ Unlike the stories of individuals typifying the naturalistic tradition, the externalist narratives insist on general terms, in which a single animal stands to represent the whole species, and the observer stands apart.

These two different kinds of narrative configure animals quite differently. In neither is the animal particularly participative, but in the externalist narrative it is almost entirely made passive.⁷ As above, we will look first at how rats fare in narrative representations (which have been the focus of research in several science studies), before considering how we can move beyond representations to a position of rat performativity and animal agency.

Some animals have meaning to us humans almost entirely in externalist, scientific terms – the laboratory rat is one example. There is relatively little ‘natural history’ of the wild rat, so internalist narratives are rare.⁸ Yet these are animals having huge significance for us, in folklore and in our history; indeed, given the role of rats as carriers of pandemics such as bubonic plague, there is a very real sense in which they have actively participated in shaping human society as we know it (Hendrickson, 1983).

Despite the dearth of rat natural history, lab rats are used in millions in scientific procedures throughout the world. But how do we humans understand the ‘laboratory rat’? Not surprisingly, externalist, objectifying, narratives are inevitable. The animals are typically referred to as ‘the laboratory rat’, as though that descriptor defines a species, and despite the many

dissimilarities between rats in laboratories and those in the wild (Birke, 2003).

Meanwhile, lab rats are hidden from view, erased linguistically and materially. They are given numbers ('300 rats were used'); they stand as 'models' for humans; how they live is rarely important enough to include in reports; they are hidden away in ranks of cages in specialized animal houses (Birke and Smith, 1994); their use and deaths are considered more acceptable than the use of many other animals. They become, in some senses, data: what outside the lab might have been a 'naturalistic' animal (like the ones in the sewers) makes a transition to being an 'analytic' animal as parts of their bodies are transformed into laboratory artefacts (such as histology slides: see Lynch, 1988). Not surprisingly, they are frequently referred to as 'laboratory tools' and their development described as creating the 'right tool for the job' (Clarke and Fujimura, 1992).⁹

Lab rats, then, are made discursively into part of the laboratory. But this is much more than mere linguistic turns, for the entry of rats into laboratories is profoundly embedded in a whole industry of activities and institutions. This is where Barad's approach is important, to locate the materiality of the rat in the processes of meaning-making. Rats are, in important senses, agents of their own history, and consequently of the history of scientific knowledge (which owes a very great deal to laboratory animals of all kinds).

However rats first got into laboratories (and some certainly came from the wild), they were soon kept (from the late nineteenth century on) to be bred selectively for laboratory use, to create specific animals to occupy specific locations in relation to laboratory space and practice (Logan, 2001). In that sense, they have come to embody materially a whole set of specific practices – linguistic and material – which define what takes place in laboratories. Their development from the early twentieth century was the materialization of the demand for standardization – epitomizing the demand to be 'more scientific'; in turn, laboratory equipment (cages, stereotaxic equipment to immobilize animals' heads and so on) has evolved to fit standard rats, while rats are further standardized to fit the apparatus. They have, quite literally, been bred to fit the laboratory, its technologies, and its practices (Clause, 1993; Logan, 2001).

Scientists may have specific, intra-active, relationships with rats in the laboratory (see Dewsbury, 1992) – or they may not (if, for instance, someone else handles the rat and produces whatever rat part the scientist wants further away in the laboratory). In either case, rats occupy a complex place in a wide array of material and semiotic practices, *and their own behaviour plays a crucial part*. For instance, strains of rats in the early twentieth century were selected for specific traits, including their sexual precocity and their docility to enable easy handling (Logan, 2001), while a crucial part of laboratory training for humans is how to manage the behaviour of the animal (such that human management of experimental protocols is dictated by the rats' responses: biting and squealing causes problems. See Lynch, 1988). In both senses, rats' behaviour played a crucial part in the development of modern science and the making of scientists.

So, we might apply the concept of performativity here to the behaviour of the rat: the notion of 'lab rat' is a doing, a production of meanings within and outside of science. But, as mentioned earlier, it is important to stress that performativity should be understood as a material-semiotic process in the posthuman sense (Barad, 2003); the rat itself is an agent in the process, whether it obligingly reproduces to order or squeals and bites the experimenter. So too are the technologies (cages, etc.) which produce and are produced by rats-in-laboratories.

Indeed, what we understand as 'the laboratory rat' is something of a hybrid, constituted jointly by the animal, the people and various associated technologies (standard cages; devices for weighing or killing; food-stuffs and so on: see Birke and Michael, 1997). In that sense, 'laboratory rat-ness' is a part performed to fit very precisely into the scientific enterprise; meanings emerge from a nexus of apparatuses, animals and people.¹⁰ And just as gender is 'the repeated stylization of the body, a set of repeated acts within a highly regulatory frame that congeal over time' (Butler, 1990: 33) and literally embody how we are in the world, so the rat body congeals a whole set of technologies and practices.

Although at first glance, the lab rat seems to be the epitome of obliteration through standardization and the distancing stance of scientific reporting, all of which seem to make it disappear, yet it has been an actor in its own history. Indeed, it is precisely the role of rats as actors that can help to destabilize the human/animal binary. The long history of standardization, use of the passive voice, legal frameworks of animal experimentation,¹¹ and ethical justifications for using non-human animals – all these operate to maintain a clear discontinuity between humans and other animals. They serve to separate humans from non-humans, both in time and space, and conceptually. Thus even though our culture sometimes includes humans in the category animal (and nowhere is this more clear than in biological sciences, with their belief in evolution), the *practice* of science perpetuates a boundary. On this boundary fence sits the rat, which can at times refuse to play the game of scientific object. Among other things, it can turn round and sink its teeth into the experimenter.

The participating animal

The separation of 'animals' from humans, on which we focus here, has a long cultural history, sitting uneasily alongside our reluctant acknowledgement that humans also belong in the larger category 'animal'. But in the practices and discourses of science, that tendency toward separation is at times re-enacted and reinforced, gaining authority and power, whether by objectifying language or the creation of living apparatus. Ironically, separation is happening in the very branch of science whose centrepiece theory, evolution, would emphasize our similarity to, and continuity with, other animals.

Darwin himself, however, might not recognize the style of writing about animals that has come to characterize scientific writing,¹² which became increasingly codified and objectifying throughout the twentieth century

(Bazerman, 1988). In her analysis of narrative style in ethological writing, Crist argues that when ethologists and sociobiologists ‘displace the language of the lifeworld with a technical idiom, all the elements of the animal world change, and readers find themselves hovering over a very different landscape’ (Crist, 1999: 87). This shift, she argues, creates another way of ‘seeing’ (Crist, 1999: 3).

More recently, however, another way of seeing in natural science is appearing, which seems to permit animals a greater agency. In parallel with the growth in public and academic interest in animal issues, scientific accounts of animals have begun to change. Within ethology (the scientific study of animal behaviour), for example, there is growing recognition that the older image of animals as hard-wired automata is misleading; on the contrary, many kinds of animals are much more self-aware, much more conscious, than we have – in our human arrogance – tended to assume (e.g. Bekoff, 2002; Rogers, 1997). Within this literature, non-human animals are beginning to appear as actors and as subjects of a life, not merely objects of study; they are not simply acting out their instincts but are engaged in complex decisions about their lives. Not surprisingly perhaps the writing style changes, too: it is hard to write about thinking, feeling individuals in distant, objectifying, ways (as Wieder, 1988, noted about laboratory researchers working with chimpanzees).

This perspective changes the construction of ‘the animal’. In particular, understanding ‘what animals do’ when the animals in question are living in close proximity to us (companion animals, for example) means understanding how animals themselves participate. It also means understanding how both human and animal are engaged in mutual decision-making, to create a kind of choreography, a co-creation of behaviour (see Game, 2001; Haraway, 2003; Sanders, 1999). That is not an easy understanding to obtain: empirical studies of human/animal relationships tend to draw from sociology or ethology and inevitably focus primarily on one or other participant rather than the ongoing intra-action.¹³ Yet some scholars have begun to ask questions about the *relationship* and its maintenance. Ann Game, for example, writes about the fine tuning of horse–human intra-action in advanced riding, while both Haraway and Sanders write, in different ways, about the development of dog–human relationships. What is clear from these new writings is an emphasis on co-creation, a kind of mutual becoming. We are already, notes Haraway regarding our very close relationships with domestic dogs, deeply biologically entwined and have been ever since dogs first chose to live with us.

What these close associations also mean is that we are intra-acting not with the scientific abstraction *Equus caballus* or *Canis familiaris* when we engage with horses or dogs, for example. On the contrary, these are no longer to be understood only in terms of their wild counterparts, but as something else. In that sense, the sociological studies which have looked at (say) human relationships with specific breeds of dogs are closer to the relationship than those natural scientific studies which continue to abstract to the wild species. Herds of wild horses on the Mongolian

steppes¹⁴ do not have so much in common with selectively bred competition horses, engaging daily with humans.

It is in the close associations of humans/animal companions that the animal's participation in performativity becomes most clear. If performativity is repetitions consolidated over time (Butler, 1990: 33), then how we intra-act with companion animals sharing our lives (and some other animals besides) is clearly performative. If we speak of the 'animality' of, say, a dog, we draw partly on multiple cultural representations of dogs and other non-humans. But we also infer an embodiment of the lifelong intra-action of dog with human: from its very first breath, a puppy is usually engaging in a combined doghuman world.

Infant horses, similarly, must in our culture learn to socialize both with their mother and other horses, *and also* with humans, who must themselves learn how to socialize with horses. Later, when the horse is ridden, both horse and rider perform together in repeated acts which 'congeal over time' to create what Ann Game calls 'embodying the centaur' (Game: 2001). This is a materialization, such that both horse and human bodies *are changed*; riders seem to carry within their bodies subtle knowledge of how horses react – as do horses of human riders.¹⁵ Nervous impulses and muscle twitches have become transformed, new material-semiotic practices created. In so doing, a hybrid is created – a hybrid which itself can have its own performativities and relationships to other social and cultural institutions.

In such cases of non-humans so closely associated with us, the inter-relating of human and non-human is profoundly intimate. Not only may the behaviour of each be finely tuned, but there are almost certainly what Haraway (2003) has called 'potent transfections' – literal transfer of DNA between the two. Together, dog-and-human (say) or horse-and-rider constitute a different entity, which is deeply enmeshed in complex social and technological networks and their practices (Haraway, 2003; Birke and Michael, 1997). The arbitrary allocation into social/cultural (human) and biological (non-human) makes little sense in the light of such transfections.

Yet even in the apparent abstraction of the laboratory (or, more precisely, the animal house serving the laboratory), both rat and humans must learn to live in their highly specialized, but co-created, world. While less familiar, it too involves a choreography, dancing to the tunes of experimental protocols. Sometimes it involves quite deliberate 'potent transfections',¹⁶ if the rat is injected with some human disease. But what we would emphasize here is the co-creation of rat and humans, through their daily intra-actions, to *produce* the practices of science.

So, for many animals, they must learn to participate in a conjoint world, to work with and to recreate it, just as the human must learn to participate in the same conjoint world. Both engage in repeated acts within regulatory frameworks (whether these be relatively local, such as Kennel Club rules, or more general, such as legal-cultural frameworks structuring how humans keep animals). 'Animals' emerges not as a pre-existing category but as something produced by these conjoint actions, and given particular power within the set of actions we call science.

Implications: performativity across the disciplinary divide

There are two steps in our discussion of performativity. The first, through analysing how we animal the animals, attempts to bring non-humans out of the categories of 'biological', 'automata', or 'alien essences' and to make the human/non-human boundary more permeable. This draws on several studies which have looked at animal representations in, say, scientific practice. The second step, however, moves us beyond representation, by taking a closer look at the participation of the animal actors, and focusing on the performativity of the two participants in relationship to create something that transcends both – a higher order phenomenon.¹⁷ Thus, there are three kinds of performativity here – of animality, of humanness, *and of the relationship between the two*.

In this final section, we outline some of the ways in which these considerations might usefully cut across disciplinary divides. In particular, we suggest that feminist theory could benefit from a more sustained analysis of 'animality' and how humans and animals mutually engage; likewise, studies of the human/animal relationship could also benefit from feminist scholars' interrogation of gender and its performativity. In turn, we also ask about how these questions generate some further implications for thinking about performativity.

Why does thinking about human/animal performativity matter to feminist science studies, or human/animal studies? One of the ways in which animal studies may influence feminist theory crucially is by offering a productive site for elaborating the burning question of the agency of matter and biological bodies. Much feminist theorizing has emphasized the ways in which bodies matter. In the last decade a growing number of feminist theoreticians (e.g. Haraway, 1991; Butler, 1993; Grosz, 1994; Braidotti, 2002) have addressed the question and tried to shift the perspective from looking at the body as a mere passive recipient of social inscriptions to an outlook which sees the body as an active agent co-acting or intra-acting with social inscriptions. We suggest that a focus on animals can add new productive dimensions to these discussions, so posing the question of the agency of matter in complex new ways.

Animal studies may thus make up a productive site for examining the agency of matter, but avoiding some of the pitfalls. When we, for example, talk about the agency of matter in the shape of human bodies, it is easy to slip back into a discussion of human subjectivity as though it is not embodied. And when we consider the agency of machines and non-organic matter, it is also easy to short-circuit the discussion back into mere human instrumentation or orchestration of machinic performance, once again setting the human subject as the prime mover.

Contrary to both human bodies and machines, however, animals are less easily discarded as subjects in their own right. They are, on the one hand, defined as non-human matter in anthropocentric Western philosophy. But on the other hand, even hard-core instrumentalizing behaviourism or socio-biology is adapting to new understandings of animal cognition, so that non-humans are now less often reduced to the status of controlled robots.

Debates from feminist theory can also aid work on the human/animal relationship. We noted earlier, for instance, how a consideration of human/non-human dyads (rather than on humans or non-humans) might provide a fresh focus, from which to evaluate how borders might be transgressed, and how conjoined agency might operate. Consider, too, Barad's use of performativity to break through the persistent dichotomy between language/representation and the material that is represented. Matter, she proposes, is not a fixed substance, but a doing; that is, matter – the concern of science – must be understood as jointly emerging from material and discursive factors (Barad, 2003).

Thinking about how we think about animals is useful here, as animals both are the material stuff which (biological) science studies and have an (increasingly recognized) subjectivity. If 'dogness', say, is a material *and* discursive product, then we have to understand that in its relationality and performativity. We cannot hope to understand it by selectively focusing on the behaviour of dogs as though they were domesticated wolves, to be studied 'objectively' through science. The problem here is that, at the moment, science is not very good at understanding relationality. Anecdotes abound and data are few (though, as Bekoff points out, we should heed these stories, for the plural of anecdotes is data: Bekoff, 2002: 47). Rather than pursuing an illusory objectivity, scientific studies of animals and of human/animal relationships might usefully borrow from feminist theory, and focus instead on the *performance* of human-plus-non-human – where the constituting discursive practices must be understood to include the material, participating non-human.

While advocating performativity as a useful tool in aiding our thinking about humans and animals, however, there are two dangers. The first is that 'performativity' may be seen only as a product of the individual's engagement with her social world. What we would emphasize here, however, is the need to focus also on *relationships*, which may themselves generate their own performativities; that is, as we noted before, performativity can be thought about in three ways – the human, the animal, and the conjoint hybrid (however that is constituted).

Second, we have written about performativity in a way that suggests that the relationship of human to non-human creates an emerging order. Indeed – but it can also generate disorder, the unravelling of social predictability. Michael (2004) discusses how the 'interruptions' of non-human animals can completely alter sociological research interviews (and everyday social encounters). At times, these 'interruptions' may be construed as 'misbehaviour' on the part of the animal, by either the interviewee or the researcher. In this case, the engagement of the animal is disrupting the creation of social data in ways likely to reinforce its own categorization into 'animality'. Both humans and non-humans, argues Michael, act together to produce both order and disorder in their joint social worlds.

Conclusions

Thinking about human relationships to animals raises crucial questions not only for feminism but for science studies in general. Animals, after all, are part of what scientists study. Like gender performativity, the processes of human/animal relating constitute discursive practices which *create* animality – and which reproduce relations of power. For in the case of those animals closest to us, it is those behaviours with which we can interact easily which will be reproduced: we humans do not wish to live too closely with the ferocity of savage nature. This is evident if we think about the development of companion animals and their socialization into humanly acceptable forms of behaviour. It is even more evident in the case of laboratory rodents, transformed by breeding programmes into placid bearers of data.

As we implied earlier, biology emphasizes both our similarity and dissimilarity to non-human animals. Similarity is assumed whenever scientists use animals in laboratories as physiological stand-ins, for instance as ‘rat models’ for some human disease. It is assumed whenever biologists speculate on the evolutionary origins of particular human traits. But there are also sets of practices and performativities, both human and non-human, which reproduce ‘the animal’ as something apart, as different. Understanding how those work is central to understanding science, and the way that its discursive practices themselves create the species differences that science studies. Indeed, we might even say that the very use of non-human animals in laboratory science *enacts* a radical discontinuity between non-human and human. Using concepts of performativity can, we argue, help us to challenge that separation of non-humans from humans; both human and animal can conjointly be engaged in reconfiguring the world, as Barad (2003) notes. We are all matter, and we all matter.

Feminism needs, we suggest, to analyse further the processes whereby these differences are created, particularly through the authoritative voices of science. We need to understand more about ‘animality’ – and hence, ‘humanness’ – and how that cuts across gender. But that must be done in ways that allow for animal agency, participation, and performativity – whether they are stag beetles, laboratory rodents, or companions by the feminist fireside.

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Notes

1. Barad (2003: 815) substitutes the notion of ‘inter-action’ with ‘intra-action’ in order to stress that the actors in a performative relationship should not be seen as distinct entities, acting upon each other from ‘outside’, but as intertwined agencies which mutually construct each other. We will follow this practice in the article.

2. This is an ongoing project; we first presented work on this, using examples from insects in natural history documentaries, and laboratory rats, at a meeting of the Society for Literature and Science, at Aarhus, Denmark, 2002 (and see Lykke and Bryld, 2003; Birke, 2003). The role of insect actors and visual technologies in the production of popular film documentaries is a particular focus of this work, as well as examples from ethology.
3. Throughout this paper, we use the term 'animal' to denote non-human animal species, unless otherwise specified. The word 'animal' carries many layers of meanings, and can certainly include humans (as in the biological classification of the animal kingdom). However, we chose to follow common colloquial use of 'animal' as not human, precisely to explore the issues raised by cultural separation of non-human animals from humans – particularly in science. Note that 'animal' here is profoundly homogenizing, as though each kind of animal is the same, instead of profoundly different. They are only the same in the effect of the word 'animal' as counterpoint to 'human' – itself not a straightforward term. Midgley (1978) explores the significance of that opposition in Western culture in her aptly named *Beast and Man*. Later in the paper we address the more inclusive sense of animal/human, which sits more easily with the notion of performativity.
4. See for example Birke and Michael (1997) who discuss such cultural hybrids and their constitution through intervening technologies (such as dog leads). Also see Michael (2004).
5. Thus, the legislation governing animal use in scientific research in the UK covers all vertebrates and now includes cephalopod molluscs (squid and octopus), while in the US some animals (including rats and mice) are excluded from the definition of animal for the purposes of the legislation.
6. One of us (LB) disagrees with Crist in that early ethology did still bear traces of the natural history heritage. The externalist imperative was, however, true by the late 1960s, and part of LB's training in ethology then emphasized the need to avoid at all costs anthropomorphism (see Kennedy, 1992).
7. We explore this further in relation to the behaviour of insects in natural history documentaries; see Lykke and Bryld (2003).
8. With one or two exceptions, such as Barnett's study of the rat, which partly employs an internalist style (Barnett, 2001).
9. Such terminology implies that tools are passive objects; but, as Barad emphasizes, tools and apparatuses are themselves part of the meaning-making of science and as such should be thought of as having agency. Our point here is to stress how often animals are referred to as 'tools' in scientific literature.
10. Nearly forty years ago, one commentator noted that the white lab rat is '... so entrenched in its cozy new habitat that it has influential members of the host species emotionally committed to its continued welfare' (Lockard, 1968). Although we have not drawn explicitly on actor network theory here, this enrolment of welfare-minded people by lab rats is an example of how networks are created between humans and non-humans (animals or technological artefacts: see Callon and Law, 1982; Philo and Wilbert, 2000).

11. See note 6, above.
12. Darwin was quite prepared, for instance, to write about the emotions of animals, and to quote from single examples in ways that would probably not be acceptable today.
13. Crowell-Davis (1992) notes the lack of studies of human/horse interaction, and effects of humans on horses, despite the clear benefits such research might bring to the performance of horses in competitions. That lack remains true ten years later.
14. If there is such a thing as the original wild horse: even the indigenous Przewalski's horse has had to be reintroduced into Mongolia.
15. Anecdotes abound in the world of riding for the disabled of horses apparently helping to keep disabled children on their backs.
16. It is ironic that for some experimental purposes colonies of lab animals have to be protected from human-borne disease by living their lives behind barriers. Potent transfections indeed.
17. Fausto-Sterling (2003) notes how discussion of Butler's notion of performativity of gender could usefully be extended to how non-human animal gender develops, rather than the widespread assumption that gender in non-humans emerges out of some genetic blueprint. She draws on Developmental Systems Theory (also see papers in Oyama et al., 2001), which insists on understanding how organisms develop as systems of processes; genes and environment are part of these systems but cannot be separated out. Together, they create something emergent, or higher order – the form of the organism. Even the gender of the humble laboratory rat cannot simply be attributed to genes, as the mother's behaviour toward her offspring (among other things) influences gender-related behaviour.

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