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Actor-network theory

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Actor-network theory (ANT) has attracted considerable attention in the social sciences in recent years and influenced many empirical researchers, particularly in the fields of science and technology studies and more recently in social studies of finance. Although it is neither a research method nor a methodology, like other broadly philosophical approaches to the social sciences it does have implications for how we should approach social research. This entry briefly outlines some of the key features of actor-network theory and the orientation to research that it encourages, but its primary focus is to provide an evaluation of ANT. ANT has both strengths and weaknesses, and both have instructive implications for social research methods.

Key concepts

Any brief attempt to summarise a research tradition is likely to miss important features of it and the variation between different versions of the tradition. This is perhaps particularly true of actor-network theory, which actively encourages views of itself as complex, changing, and multiple. Its leading advocate Bruno Latour, for example, has famously questioned every element of the name

‘actor-network theory’ which he himself introduced (Latour, 1999a). Anne-Marie Mol has argued that the world we study is multiple: “that different practices tend to produce not only different *perspectives* but also different *realities*” (Law, 2004, p. 13) and one implication is that ANT itself could be seen as multiple. Indeed one critic has suggested that advocates of ANT switch between different readings of it to evade criticism (Kanger, 2017).

Nevertheless there are elements that seem to be well established within the tradition. Perhaps the most fundamental is the claim that our world is composed of assemblages (also known as actants, actors, actor-networks, and articulations, to list only the ‘a’s). While the concept itself comes from Deleuze, the version advocated in ANT is distinctive – or at least, it seems to have narrowed down the range of meanings found in Deleuze. As in Deleuze, the word (derived from the French *agencement*) refers to something that falls somewhere between a thing and a process, with elements of both. For actor-network theorists, assemblages are open, transient, unique networks of influences or associations: “an actor-network [= an assemblage] is what is made to act by a large star-shaped web of mediators flowing in and out of it. It is made to exist by its many ties: attachments are first, actors are second” (Latour, 2005, p. 217). Or as John Law puts it, “assemblage is a process of bundling, of assembling, or better of recursive self-assembling in which the elements put together are not fixed in shape, do not belong to a larger pre-given list but are constructed at least in part as they are entangled together” (Law, 2004, p. 42). Although Latour in particular tends to avoid terms like *causality*, his talk of how things are “made to act” is a clear indicator that ANT is oriented to providing something like causal explanations of how events happen.

It is tempting to think of assemblages as corresponding to our everyday concept of objects or things (and in some readings of Deleuze they do), but this would misrepresent Latour’s ontology. One distinction which might help to clarify the difference is that assemblages are not bounded in the simple spatial way that ordinary things are. An assemblage is not a thing, but a coming together of influences. The point is illustrated in Latour’s discussion of the work of the French scientist Louis

Pasteur on the process of fermentation, which Pasteur attributed to the influence of yeasts. Pasteur, Latour tells us, "encountered a vague, cloudy, grey substance sitting meekly in the corner of his flasks and turned it into the splendid, well-defined, articulate yeast twirling magnificently across the ballroom of the Academy" (Latour, 1999b, p. 145). "Yeast", in this sentence, is not simply another name for the same "vague, cloudy, grey substance" that had always existed; rather, it is a different assemblage, in which Pasteur's own theories are among the elements or mediators that are bundled with or attached to the grey substance. Latour calls this *articulation* – yeast is an articulation of some material stuff and the ideas produced by science that relate to that stuff (and indeed other elements too, including perhaps the equipment required to support those ideas and the publications in which they are asserted) (Elder-Vass, 2015, pp. 104–8). A sample of yeast, then, is not a simple material object with the spatial boundaries that implies, but a conflation of reference and referent, of the object with many related influences which ordinary realists would regard as external to the yeast.

The case also illustrates another central element of actor-network theory: its refusal of various closely connected binaries that Latour associates with the modern humanities and social sciences in general, including the binary divides that he claims previous thinkers assume between society and nature, human and non-human, and subject and object (Latour, 1993). Latour's notion of yeast, for example, no longer locates it unambiguously in the categories of *natural*, *non-human*, and *object*, because for him the assemblage we call yeast includes textual, human, and subjective elements. One might question whether earlier thinkers are quite as dualistic as Latour suggests, but there is no doubt that he takes anti-dualism much further than most of his predecessors.

Latour has strong views about the implications of this perspective for the research process. Research, he argues, must "follow the actors" (Latour, 2005, p. 68), or follow "associations" (Latour, Jensen, Venturini, Grauwin, & Boullier, 2012, p. 591) - the connections that make up assemblages. But this injunction to follow the actors raises more challenging questions than it solves. For example, how is a researcher to identify an actor/assemblage in the first place, when the boundaries of actors

are so open and fluid? And do actors exist in forms that the researcher is to discover, or is the extent of the network of connections that make up an actor a construction of the researcher? Can boundaries *ever* be drawn between actors? How can we identify the constituent elements of actors when those constituents themselves are to be conceived of as assemblages rather than as conventional physical objects? How is the researcher to resist the collapse of analysis into a melange of vague influences between unbounded networks?

Although some ANT-influenced researchers engage with some of these concerns, often these problems are resolved in a way that subverts the official ontology of assemblages. Without any systematic means of delineating assemblages, the elements that are put together to define an assemblage are just whatever mix of ordinary observable objects and people that the researcher thinks are relevant to the problem at hand – people, flasks, grey substances, and recording devices for example – rather than *assemblages* as Latour defines them. The assemblage concept is then rolled out whenever this crude empiricism needs to be clothed with some philosophical respectability. In such cases ANT functions not as a solution to any of the classic issues raised by empirical social research but as a means of evading them.

Strengths

Still, one must judge a tradition by its most consistent applications, so let us turn to the strengths and weaknesses of ANT in its Sunday best. ANT has several major strengths, particularly by comparison with some well-established approaches to social research.

First, the injunction to follow the actors produces careful attention to the multiple interacting factors that produce any given event. Like many post-positivist approaches to social research, it tends to dismiss talk of causes, and yet as we have seen it does produce something like causal explanations. This apparent contradiction can be explained: the kind of causal explanation that ANT (like poststructuralism) dismisses is the variety espoused by positivists, in which cause is reduced to a statistical relationship between quantitative variables. Rather than dispute this interpretation of

cause, these traditions tend to give up the term altogether, but it may be more productive, and more in tune with lay understandings of the concept, to insist on a different interpretation. If we take causes to be factors that interact to produce an outcome, regardless of whether any statistical regularity can be observed, then what ANT advocates is a kind of causal analysis that allows us to trace causes of individual events and the often complex relations between them. This is certainly an improvement on the positivist approach.

Second, inspired by Latour's implacable hostility to dualism, ANT encourages us to consider material objects and not just human, social, or cultural factors as contributory causes of social events. While it is a gross exaggeration to suggest (as Latour does) that all earlier approaches to social science ignored the influence of material objects, it is true that there have often been tendencies to neglect them and some methodological traditions have gone further. Methodologically radical advocates of hermeneutic interpretivism, of social constructionism, and of poststructuralism have argued that the social sciences should be concerned exclusively with human meanings and the social or cultural forces that shape them, to the exclusion of material factors. Yet it is hard to see how we could make sense of, let alone explain, science, technology, digital culture, the economy, healthcare, and myriad other social phenomena while ignoring the causal contributions of material objects. ANT has played a leading role in reinstating the material in social research and should be applauded for this.

Third, Latour encourages researchers to look deeper into influences that are attributed to larger social powers. He argues that "The idea of a society has become in the hands of later-day 'social explainers' like a big container ship which no inspector is permitted to board and which allows social scientists to smuggle goods across national borders without having to submit to public inspection" (Latour, 2005, p. 68). Latour demands that these containers are opened up and their contents explicitly examined – that we challenge social concepts used as taken for granted explanations and identify the processes and interactions that *produce* what we think of as social influences. Shortly I shall question the way in which Latour uses this argument to deny the existence of social structural

forces, but it remains true that advocates of social structural explanation have sometimes been guilty of taking concepts like structure and power for granted. ANT is right to demand that defenders of structural explanation should show how these structural forces come about.

There are, then, methodological benefits of ANT's approach, but I argue that it is possible to achieve the same benefits without ANT's accompanying disadvantages, to which we now turn.

Weaknesses

As we have seen, Latour is firmly opposed to dualisms of the *natural* on one side and the *social/human/cultural* on the other. While this has the benefit of encouraging social researchers to consider the causal contributions of material objects, ANT's response is carried beyond this. In rejecting dualisms, ANT also rejects weaker and more reasonable versions of the related distinctions. It is not dualist, for example, to think of human beings as *different* from other kinds of things. This does not entail claiming a special metaphysical status for human beings, because we can equally validly make the equivalent point for other kinds of things: yeasts, for example, are different from other kinds of things, but saying so does not commit us to a metaphysical dualism of yeast vs. non-yeast. Yet ANT insists on treating other kinds of things as if they had the same properties as human beings (it is significant, for example, that they often call assemblages *actors* when traditionally only humans are thought to have the capacity to *act*). This leads to two problems.

First, actor-network writers persistently talk about nonhuman things in terms that would only make sense if they actually were human (Elder-Vass, 2008, pp. 468–9). Michel Callon talks about researchers *negotiating* with scallops (Callon, 1986, pp. 211, 215). Bruno Latour, discussing a prototype transport system, says "The same sort of involvement that has to be solicited from [various organisations] now has to be solicited from motors, activators, doors, cabins, software, and sensors. They, too, have their conditions; they *allow* or *forbid* other alliances" (Latour, 1996, p. 57). But scallops do not negotiate, and train doors do not allow or forbid: they are incapable of doing so. This is another variety of empiricism – from a purely observational (or behaviourist) point of view

the behaviour of the scallops does not meet the expectations of the scientists, just like the behaviour of a human who refuses to negotiate. But human beings are a different kind of things than scallops, with different capabilities arising from their different structures and histories, and no-one who recognises this could talk of scallops *negotiating*.

Second, this denial of the distinction between human and non-human actors not only misrepresents the causal capacities of non-human objects, it also effaces the significance of the capacities of human beings. Human beings interpret the world, they communicate using language, they evaluate and judge, they reflect on their circumstances, they make decisions. Like the capacities of social structures, these human capacities need to be explained, but explaining them does not explain them away. And the consequence is that human beings can influence the world in ways that non-human objects cannot (though other animals and computerised robots can approximate to some of them). But Latour largely ignores these capacities and, ironically, the contribution that the material parts of human beings make to providing them. Instead, he prefers to place the contributors to action outside the actors, rather than examining how the actors themselves could ever come to act: "An 'actor' . . . is not the source of an action but the moving target of a vast array of entities swarming toward it" (Latour, 2005, p. 46) (also see Elder-Vass, 2008, p. 470). Actor-network theory, in other words, fails to take human agency seriously and ignores both the issues that it raises and the resources it offers – crucial resources for the social sciences – for explaining some of the factors that contribute to bringing about social events.

This failure to take the particular properties of human actors seriously contributes to a third, equally consequential, failure: the rejection or radical neglect of the role of social structures in causing social events. Despite occasional qualifications, Latour consistently argues that researchers should replace accounts that cite social structures as causes with accounts that trace the connections between individual actors (human or otherwise). He wants us to dismantle the social, so that "the study of society therefore moves from the study of the social as this is usually conceived, to a study of

methods of association" (Latour, 1986, p. 264). In the sociology that results "there is no society, no social realm, and no social ties" (Latour, 2005, pp. 108–9). So states, cultures, organisations, inequality, patriarchy and the like all disappear from view, never to be allowed an official return.

Earlier I praised Latour's insistence that we examine what lies behind the social. However, for Latour this is a rhetorical move that paves the way for dispensing with the social altogether, whereas it would be more productive as an explanatory move that helps us to explain how the social works. The explanatory strategy leads to the conclusion that social structures are different from other kinds of causal structures because they depend on the intentional properties of human beings – our abilities to represent, think, and communicate, for example. This is the sense in which Latour's denial of the distinctive properties of human beings contributes to his failure to recognise the distinctive properties of social structures: structures that depend on how people think (though also, of course, on other factors including the contributions of material objects). Refusal to recognise these distinctions leaves us incapable of explaining enormously important social forces – incapable both of explaining how they come about and of explaining how they impact upon the world. This is not only profoundly unsatisfactory from an explanatory point of view, but also profoundly reactionary, denying the need for critique of social structures by denying their causal significance entirely.

ANT's repudiation of structure and agency is by no means its only weakness. Indeed these moves reflect another, more fundamental, problem. For Latour and his fellow actor-network theorists, assemblages are not only vaguely bounded and transient but also unique. No two assemblages are the same, or even similar enough to fall into causal types: classes of object that have similar causal capacities (Elder-Vass, 2015). This denial of causal types is part of what lies behind ANT's denial of human distinctiveness: if there are no causal types then there is no basis on which to say that humans are similar to each other in some respect that marks them off from other kinds of things.

But the denial of causal types also has worrying methodological consequences. If there are no causal types, then we can never use our knowledge of how other members of a type behave to help us

explain the causal contributions of objects to events. Consider, for example, a case discussed by Latour, in which scientists conclude that earthworms are helping to extend the reach of a tropical forest by ingesting fertile soil from the forest zone and then excreting it in the sandy area beyond the forest edge, thus creating conditions in which the forest flora can grow (Latour, 1999b, pp. 74–6). Scientists can observe the behaviour of individual earthworms, and analyse the content of individual soil samples, but they can conclude nothing about the larger-scale process unless they can generalise their conclusions to a much larger population of unobserved earthworms on the grounds that they are all of a similar type and therefore can be expected to behave in a similar way in similar circumstances. Or consider a classical sociological case: when I observe a friend raising her hand and gesturing in a certain way, I can conclude that she is greeting me, but only because I know that when people who share certain cultural knowledge gesture in this way they mean to wave, and mean that waving to function as a greeting. I do not need to examine the neural pathways that formed in my friend's head, or cross examine her about her intentions when she made that gesture, because I can assume that she is an instance of a causal type: people with certain cultural beliefs about waving. Without the assumption that objects fall into causal types almost all explanatory and interpretive work is impossible, and of course actor-network researchers themselves implicitly rely on this assumption in their own work, in flagrant contradiction of the official ontology.

Improving on ANT

How is one to respond to a research tradition that mixes significant advantages with highly problematic flaws? If the flaws can be resolved within the fundamental framework of the research tradition, one might work within it and seek to change it. But the flaws of actor-network theory flow from its central ontological commitments, and in particular the version of assemblage theory around which it is constructed. In these circumstances it makes more sense to embrace a different tradition that can provide (or be flexed to provide) those advantages without the flaws.

Thus, we need a tradition that recognises the interacting causal contributions to social events made not only by material objects and people, but also by social structures. We need a tradition that recognises the distinctiveness of the causal capacities of human individuals and the roles that culture and social structure can play as a result of those distinctive capacities. We need a tradition that recognises that every event is brought about by a unique configuration of causal forces but also that many things fall into causal types and that this is what makes it possible for us to analyse causal forces in the first place. I suggest that such a tradition is already available, in the shape of various strands of post-positivist sociological realism, although there is certainly also scope for that tradition to learn from the strengths of actor-network theory.

Further Reading

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