Actor-network theory

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Actor-network theory, often abbreviated as ANT, is a distinctive approach to social theory and research which originated in the field of science studies. Although it is best known for its controversial insistence on the agency of nonhumans, ANT is also associated with forceful critiques of conventional and critical sociology.

Developed by Science and Technology Studies (STS) scholars Michel Callon and Bruno Latour, the sociologist John Law, and others, it can more technically be described as a "material-semiotic" method. This means that it maps relations that are simultaneously material (between things) and semiotic (between concepts). It assumes that many relations are both material and semiotic. For example, the interactions in a bank involve both people, their ideas, and technologies. Together these form a single network.

Actor-network theory tries to explain how material–semiotic networks come together to act as a whole (for example, a bank is both a network and an actor that hangs together, and for certain purposes acts as a single entity). As a part of this it may look at explicit strategies for relating different elements together into a network so that they form an apparently coherent whole.

According to actor-network theory, such actor-networks are potentially transient, existing in a constant making and re-making [1]. This means that relations need to be repeatedly "performed" or the network will dissolve. (The bank clerks need to come to work each day, and the computers need to keep on running.) They also assume that networks of relations are not intrinsically coherent, and may indeed contain conflicts (there may be poor labor relations, or computer software may be incompatible).

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Methodological Influences

Although it is called a “theory” ANT does not usually explain “why” a network takes the form that it does. It is much more interested in exploring how actor-networks get formed, hold themselves together, or fall apart.

The approach is related to other versions of material-semiotics (and notably the work of philosophers Gilles Deleuze and Michel Foucault and feminist scholar Donna Haraway). It can also be seen as a way of being faithful to the insights of ethnomethodology. There are also obvious links to symbolic interactionist approaches such as the newer forms of grounded theory like situational analysis that seek to frame social circumstances as various forms of relationships associated with situations.

Broadly speaking, ANT is a constructivist approach in that it avoids essentialist explanations of events or innovations (e.g. explaining a successful theory by saying it is “true” and the others are “false”). However, it is distinguished from many other STS and sociological network theory for its distinct material-semiotic approach.

Background and context

ANT was first developed at the Centre de Sociologie de l’Innovation (CSI) of the École nationale supérieure des mines de Paris in the early 1980s by staff (Michel Callon and Bruno Latour) and visitors (including John Law). Initially created in an attempt to understand processes of innovation and knowledge-creation in science and technology, the approach drew on existing work in STS, on studies of large technological systems (see Large Technical System), and on a range of French intellectual resources including the semiotics of Algirdas Julien Greimas, the writing of philosopher Michel Serres, and the Annales School of history.

ANT appears to reflect many of the preoccupations of French Post-structuralism, and in particular a concern with non-foundational and multiple material-semiotic relations. At the same time, it was much more firmly embedded in English-language academic traditions than most post-structuralist-influenced approaches. Its grounding in (predominantly English) STS was reflected in an intense commitment to the development of theory through qualitative empirical case-studies. Its links with (largely US) work on large technical systems were reflected in its willingness to analyse large scale technological developments in an even-handed manner to include political, organizational, legal, technical and scientific factors.

Many of the characteristic ANT tools (including the notions of translation, generalized symmetry and the “heterogeneous network”), together with a scientometric tool for mapping innovations in science and technology (“co-word analysis”) were initially developed during the 1980s, predominantly in and around the CSI. The “state of the art” of ANT in the late 1980s is well-described in Latour’s 1987 text, Science in Action.[2]

From about 1990 onwards, ANT started to become popular as a tool for analysis in a range of fields beyond STS. It was picked up and developed by authors in parts of organizational analysis, informatics, health studies, geography, sociology, anthropology, feminist studies and economics.
As of 2008, ANT is a widespread if controversial range of material-semiotic approaches for the analysis of heterogeneous relations. In part because of its popularity, it is interpreted and used in a wide range of alternative and sometimes incompatible ways. There is no orthodoxy in current ANT, and different authors use the approach in substantially different ways. Some authors talk of “after-ANT” to refer to “successor projects” blending together different problematics with those of ANT.[3]

**Some concepts**

**Translation**

Central to ANT is the concept of translation which is sometimes referred to as Sociology of Translation, in which innovators attempt to create a forum, a central network in which all the actors agree that the network is worth building and defending. In his widely debated 1986 study of how marine biologists try to restock the St Brieuc Bay in order to produce more scallops,[4] Michel Callon has defined 4 moments of translation. These four moments are derived from studying:

1. **Problematisation** What is the problem that needs to be solved? Who are the relevant actors? Delegates need to be identified that will represent groups of actors. So, a union head represents workers or a Member of Parliament represents his constituency. During problematisation, the primary actor tries to establish itself as an obligatory passage point (OPP) between the other actors and the network, so that it becomes indispensable.

2. **Interessement**

Getting the actors interested and negotiating the terms of their involvement. The primary actor works to convince the other actors that the roles it has defined them are acceptable.

3. **Enrolment**

Actors accept the roles that have been defined for them during interessement.

4. **Mobilization of allies**

Do the delegate actors in the network adequately represent the masses? If so, enrollment becomes active support.

**Intermediaries and Mediators**

The distinction between intermediaries and mediators is key to ANT sociology. Intermediaries are entities which make no difference (to some interesting state of affairs which we are studying) and so can be ignored. They transport the force of some other entity more or less without transformation and so are fairly uninteresting. Mediators are entities which multiply difference and so should be the object of study. Their outputs cannot be predicted by their inputs. From an ANT point of view sociology has tended to treat too much of the world as intermediaries.

For instance, a sociologist might take silk and nylon as intermediaries, holding that the former “means”, “reflects”, or “symbolises” the upper classes and the latter the lower classes. In such a view the real world silk-nylon difference is irrelevant — presumably many other material differences could also, and do also, transport this class distinction. But taken as mediators these fabrics would have to be engaged with by the analyst in their specificity: the internal real-world complexities of silk and nylon suddenly appear relevant, and are seen as actively constructing the ideological class distinction which they once merely reflected.
For the committed ANT analyst, social things — like class distinctions in taste in the silk and nylon example, but also groups, power, etc. — must constantly be constructed or performed anew through complex engagements with complex mediators. There is no stand-alone social repertoire lying in the background to be reflected off, expressed through, or substantiated in, interactions (as in an intermediary conception).[5]

**Generalized Symmetry**

ANT assumes that all the elements in a network, human and non-human, can and should be described in the same terms. This is called the principle of *generalized symmetry*. The rationale for this is that differences between them are generated in the network of relations, and should not be presupposed.

**Actants**

ANT defines, for instance, *Actants* to denote human and non-human actors, and assumes that actants in a network take the shape that they do by virtue of their relations with one another. It assumes that nothing lies outside the network of relations, and as noted above, suggests that there is no difference in the ability of technology, humans, animals, or other non-humans to act (and that there are only enacted alliances.) As soon as an actor engages with an actor-network it too is caught up in the web of relations, and becomes part of the “entelechy”.

**Punctualisation**

If taken to its logical conclusion, nearly any actor can be considered merely a sum of other, smaller actors. An automobile is an example of a complex system. It contains many electronic and mechanical components, all of which are essentially hidden from view to the driver, who simply deals with the car as a single object. This effect is known as *punctualisation*, and is similar to the idea of abstraction in object-oriented programming.

When an actor network breaks down, the punctualisation effect tends to cease as well. In the automobile example above, a non-working engine would cause the driver to become aware of the car as a collection of parts rather than just a vehicle capable of transporting him or her from place to place. This can also occur when elements of a network act contrarily to the network as a whole. In his book *Pandora’s Hope*, Latour likens depunctualization to the opening of a black box. When closed, the box is perceived simply as a box, although when it is opened all elements inside it becomes visible.

**Tokens/quasi-objects**

In the above examples, “social order” and “functioning car” come into being through the successful interactions of their respective actor-networks, and actor-network theory refers to these creations as *tokens* or *quasi-objects* which are passed between actors within the network.

As the token is increasingly transmitted or passed through the network, it becomes increasingly punctualized and also increasingly reified. When the token is decreasingly transmitted, or when an actor fails to transmit the token (e.g., the oil pump breaks), punctualization and reification are decreased as well.

**Some criticism**

Actor-network theory insists on the agency of nonhumans. Critics maintain that such properties as *intentionality* fundamentally distinguish humans from animals or from “things”. ANT scholars
respond that (a) they do not attribute intentionality and similar properties to nonhumans; (b) their conception of agency does not presuppose intentionality; (c) they locate agency neither in human “subjects” nor in non-human “objects”, but in heterogeneous associations of humans and nonhumans.

ANT has been criticized as amoral. Wiebe Bijker has responded to this criticism by stating that the amorality of ANT is not a necessity. Moral and political positions are possible, but one must first describe the network before taking up such positions.

Other critics have argued that ANT may imply that all actors are of equal importance in the network. This critique holds that ANT does not account for pre-existing structures, such as power, but rather sees these structures as emerging from the actions of actors within the network and their ability to align in pursuit of their interests. For this reason, ANT is sometimes seen as an attempt to re-introduce Whig history into science and technology studies; like the myth of the heroic inventor, ANT can be seen as an attempt to explain successful innovators by saying only that they were successful. In a similar vein ANT has been criticised as overly managerial in focus.

Some critics have argued that research based on ANT perspectives remains entirely descriptive and fails to provide explanations for social processes. ANT — like comparable social scientific methods — requires judgment calls from the researcher as to which actors are important within a network and which are not. Critics argue that the importance of particular actors cannot be determined in the absence of “out-of-network” criteria. Similarly, others argue that Actor-Networks risk degenerating into endless chains of association (six degrees of separation — we are all networked to one another). Other research perspectives such as social constructionism, social network theory, Normalization Process Theory, Diffusion of Innovations theory are held to be important alternatives to ANT approaches.

In a workshop called “Actor Network and After”, Bruno Latour stated that there are four things wrong with actor-network theory: “actor”, “network”, “theory” and the hyphen. In a later book however (Reassembling the Social: An Introduction to Actor–Network–Theory), Latour reversed himself, accepting the wide use of the term, “including the hyphen” (Latour 2005:9). He also remarked how he had been helpfully reminded that the ANT acronym “was perfectly fit for a blind, myopic, workaholic, trail-sniffing, and collective traveler” (the ant, Latour 2005:9) — qualitative hallmarks of actor-network epistemology.

See also

- Callon, Michel
- Latour, Bruno
- Law, John
- Mol, Annemarie
- Phronetic social science
- Science studies
- Science and technology studies (STS)
- Social construction of technology (SCOT)
- Technology Dynamics
- Mapping controversies

References

External links

Bibliographies and Resources

- John Law’s actor-network theory resource (http://www.lancs.ac.uk/fass/centres/css/ant/antres.htm)
- Bruno Latour’s Page (http://www.bruno-latour.fr/)
- Normalization Process Theory toolkit (http://www.normalizationprocess.org)

Further reading

- Transhumanism as Actor-Network Theory "N00bz & the Actor-Network: Transhumanist Traductions" (http://www.hplusmagazine.com/editors-blog/n00bz-actor-network-transhumanist-traductions) (Humanity+ Magazine) by Woody Evans.


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