

<http://dx.doi.org/10.1590/0104-07072017000910017>

THE ACTOR-NETWORK THEORY AS A THEORETICAL-METHODOLOGICAL FRAMEWORK IN HEALTH AND NURSING RESEARCH¹

Ricardo Bezerra Cavalcante², Cristiano José da Silva Esteves³, Mariana Calisto de Assis Pires⁴, Daniela Dias Vasconcelos⁵, Mônica de Melo Freitas⁶, Antonio Sávio de Macedo⁷

¹ Research funding (CNPq) 404653/2016-2 and (FAPEMIG) APQ-00337-15.

² Ph.D. in Information Science. Professor, Universidade Federal de São João Del Rei (UFSJ). Divinópolis, Minas Gerais, Brazil. E-mail: ricardocavalcante@ufs.edu.br

³ Master's student, Graduate Academic Master's Program in Nursing, UFSJ. CAPES grantee. Divinópolis, Minas Gerais, Brazil. E-mail: cristianoxkm@hotmail.com

⁴ Master's student, Graduate Academic Master's Program in Nursing, UFSJ. Divinópolis, Minas Gerais, Brazil. E-mail: nanacalisto@hotmail.com

⁵ Master's student, Graduate Academic Master's Program in Nursing, UFSJ. Divinópolis, Minas Gerais, Brazil. E-mail: ddvasconcelos@yahoo.com.br.

⁶ Doctoral student in Economic Sociology. Researcher, Interdisciplinary Center for Social Sciences, Universidade Nova de Lisboa. CAPES grantee, National Post-Doctoral Program, in Graduate Nursing Program, UFSJ. Lisbon, Portugal. E-mail: monicafreitas.cno.gnr@gmail.com

⁷ Master's student, Academic Master's Program in Nursing, UFSJ. Divinópolis, Minas Gerais, Brazil. E-mail: macedo.savio11@hotmail.com

ABSTRACT

Objective: we aimed to reflect on the Actor-Network Theory as a theoretical-methodological framework in health and nursing research.

Method: reflexive study, in which principles and concepts of the Actor-Network Theory were used as a theoretical-methodological framework.

Results: the Theory can be put in practice based on the mapping of controversies as its method, defined by the following movements: 1) seeking an entry door in the network; 2) identifying the spokespersons; 3) accessing the inscription devices; 4) mapping the associations between the actants. It corresponds to a set of techniques to explore and visualize polemics and controversies, observing and mapping the social debate, especially, but not exclusively, addressing technical-scientific problems. Hence, in the scope of health and nursing, more precisely in the sphere of the complex practices where the nurses and health technologies operate, the Actor-Network Theory has emerged as a relevant and noteworthy theoretical-methodological framework. Its application can contribute to the understanding of the innovations and their influences for the group, based on associations established between the actors, following their steps without fractioning their lives, without taking isolated excerpts, following what happens in a network and what is interlinked, interfering and suffering interference.

Conclusion: in the belief that knowledge is a social product or effect of a network of human and non-human actors, instead of something produced by operating a privileged scientific method, the Actor-Network Theory figures as a promising theoretical-methodological framework for the controversial environments of health and nursing.

DESCRIPTORS: Nursing research. Methodology. Social theory. Social network.

A TEORIA ATOR-REDE COMO REFERENCIAL TEÓRICO-METODOLÓGICO EM PESQUISAS EM SAÚDE E ENFERMAGEM

RESUMO

Objetivo: refletir sobre a Teoria Ator-Rede como referencial teórico-metodológico na pesquisa em saúde e enfermagem.

Método: estudo do tipo reflexivo, que utilizou os princípios e conceitos da Teoria Ator-Rede como referencial teórico-metodológico.

Resultados: a referida Teoria pode ser operacionalizada a partir da cartografia de controvérsias como seu método, sendo este definido pelos movimentos: 1) buscar uma porta de entrada na rede; 2) identificar os porta-vozes; 3) acessar os dispositivos de inscrição; 4) mapear as associações entre os actantes. Constitui-se como um conjunto de técnicas para explorar e visualizar polêmicas e controvérsias, observando e cartografando o debate social, especialmente, mas não exclusivamente, em torno dos problemas técnico-científicos. Assim, no escopo da saúde e enfermagem, mais precisamente no ambiente de práticas complexas, onde os enfermeiros e as tecnologias da saúde operam, a Teoria Ator-Rede tem emergido como um referencial teórico-metodológico de relevante notoriedade. Sua aplicação pode contribuir para o entendimento das inovações e suas influências para a coletividade a partir de associações estabelecidas entre os atores, seguindo seus passos, sem fracionar suas vidas, sem fazer recortes isolados, seguindo o que acontece em rede e o que está interligado, interferindo e sofrendo interferências.

Conclusão: por acreditar que o conhecimento é um produto social ou efeito de uma rede de atores humanos e não-humanos, e não algo produzido por meio da operação de um método científico privilegiado, a Teoria Ator-Rede apresenta-se como um referencial teórico-metodológico promissor para os ambientes controversos das áreas da saúde e enfermagem.

DESCRIPTORES: Pesquisa em enfermagem. Metodologia. Métodos. Teoria social. Rede social.

LA TEORÍA ACTOR-RED COMO REFERENCIAL TEÓRICO-METODOLÓGICO EN INVESTIGACIONES EN SALUD Y ENFERMAGEM

RESUMEN

Objetivo: reflexionar sobre la Teoría Actor-Red como referencial teórico-metodológico en la investigación en salud y enfermería.

Método: estudio del tipo reflexivo, que utilizo los principios y conceptos de la Teoría Actor-Red como referencial teórico-metodológico.

Resultados: la referida Teoría puede ser operacionalizada a partir de la cartografía de controversias como su método, siendo este definido por los movimientos: 1) buscar una puerta de entrada en la red; 2) identificar a los portavoces; 3) acceder a los dispositivos de inscripción; 4) mapear las asociaciones entre los actantes. Se constituye como un conjunto de técnicas para explorar y ver polémicas y controversias, observando y cartografiando el debate social, especialmente, pero no exclusivamente, en torno a los problemas técnico-científicos. Así, en el ámbito de la salud y enfermería, más precisamente en el ambiente de prácticas complejas donde los enfermeros y las tecnologías de la salud operan, la Teoría Actor-Red ha emergido como un referencial teórico-metodológico de relevante notoriedad. Su aplicación puede contribuir al entendimiento de las innovaciones y sus influencias para la colectividad a partir de asociaciones establecidas entre los actores, siguiendo sus pasos, sin fraccionar sus vidas, sin hacer recortes aislados, siguiendo lo que sucede en red y lo que está interconectado, interfiriendo y sufriendo interferencias.

Conclusión: por creer que el conocimiento es un producto social o efecto de una red de actores humanos y no humanos, y no algo producido por medio de la operación de un método científico privilegiado, la Teoría Actor-Red se presenta como un referencial teórico-metodológico prometedor para los ambientes controvertidos de las áreas de la salud y enfermería.

DESCRIPTORES: Investigación en enfermería. Metodología. Métodos. Teoría social. Red social.

INTRODUCTION

Great discussion has been ongoing about the alternatives to the so-called representational approaches in organizational studies. These approaches aim to highlight the process-like aspect of organizations and their innovations, aiming to discover the associations established with the collective existence.¹ In the context of health, more precisely in nursing, this has been no different. In the complex practice environment where the nurses and their health technologies operate, the Actor-Network Theory has emerged as a relevant and noteworthy theoretical-methodological framework.²

Characterized as a branch that challenges the traditional approaches of Sociology, the Actor-Network Theory, also known as the Sociology of Associations and the Sociology of the Social, originates in the studies of Science, Technology and Society, in which the knowledge production dynamics are investigated, considering human and non-human actors. Developed as from the 1970's, the precursors are Michel Callon, John Law and Bruno Latour, a group of sociologists associated with the Center for the Sociology of Innovation in Paris.³⁻⁴ According to recommendations by Bruno Latour, in this essay, the English acronym ANT will be used for the expression Actor-Network Theory – which means an insect – “[...] a blind, myopic, workaholic, trail-sniffing and collective traveller.”^{5:28}

ANT recommends an approximation of the radically empirical field, developing research in different simple or complex contexts, and transits between macro- and microanalysis levels.

Thus, health and nursing research can also be accomplished based on this new conception of sociology.⁶

In addition, as a result of the technological incorporation in the work environments, the health professionals are increasingly relating with nonhumans.⁷ The impact of this process in the role of nursing and the efficacy of these technology in patient care has been one of the foci in nursing research throughout the past two decades. Nevertheless, considerable gaps remain in the general understanding of how nurses interact with technology.⁸ This enhances the need for a research approach that provides an understanding of the sociotechnical complexity of this evolution, where no distinction is made among technical, political and social issues.²

Motivated by the principles of symmetry, hybridization and translation, and due to its theoretical and methodological framework for the study of scientific discoveries and technological innovations, ANT has recently aroused international interest in different knowledge areas, particularly: education, information technologies, administration, sociology, history, planning, geography, environmental studies, information science, public health and nursing.^{2,9-10} In Brazil, we identified that studies related to ANT have focused on the field of digital inclusion, geoprocessing, industrial policy of informatics and innovation, financial system, information systems in health and electronic government. Nevertheless, in the health context and mainly in Portuguese, the literature about ANT remains restricted, thus strengthening the need for scientific production in that context.

Therefore, the Study and Research Group in Health Service Assessment and Management (NEPAG) at *Universidade Federal de São João del Rei* (UFSJ), in partnership with *Universidade Nova de Lisboa*, Portugal (UNINOVA), has developed research that involves ANT as a theoretical-methodological framework. The reflexive article proposed results from the multicenter study entitled "The Actor-Network Theory as a theoretical and methodological framework in organizational studies in the health context". In short, this article aimed to reflect on the Actor-Network Theory as a theoretical-methodological framework in health and nursing.

CONCEPTUAL BASES OF ACTOR - NETWORK THEORY: FOR STARTERS

In ANT, knowledge is a social product or effect of a network of materials, instead of something produced through the operation of a privileged scientific method.¹¹ Thus, Latour⁵ opposes the representatives of the sociology of the social (traditional sociology), particularly Émile Durkheim, who appoints that the social essentially consists of social bonds, as a homogeneous product. In fact, in many situations, the sociology of the social actually offers a practical and timely configuration to designate all elements accepted in the collective sphere. Nevertheless, in situations where the group frontiers are uncertain, where innovations proliferate and entities multiply quickly, the reality of the data inevitably gains complexity, in which the sociology of the social is no longer able to find new associations of actors. Then, the sociology of associations asserts itself, as this approach is more flexible to transit among reference frameworks and regain a certain degree of commensurability among situations that move at different speeds and accelerations.⁵

Also, as opposed to the sociology of the social, Latour,⁵ through the sociology of associations, withdraws the safety of the immutability of its study object from sociology, as well as the formulae that need to be employed to better explain it. The sociology of associations does not present answers, but uncertainties on the nature of groups, action, things, facts and on the way of knowing and writing about the social; that which has no *a priori* substance and whose existence needs to be constantly reaffirmed to be able to continue to exist. Thus, Latour⁵ destabilizes the social scientist and removes him from the privileged position that allows him to say that the actors do not know what they do, while scientists do now. According to Latour,⁵ both actors and sci-

entists participate in the construction process of the social and are intrinsically linked by aspects related to identity, participation and group.

Moreover, in ANT, knowledge is a social product of a network of heterogeneous materials and suggests that society, organizations, agents and machines are all effects generated in networks of certain patterns of diverse materials, not just human. In this sense, ANT makes sociology less anthropocentric, as it points to nonhumans as full-fledged actors who help understand the humans and social. Thus, the reductionist version of the material social order is diluted, giving space to ANT, which does not conceive the idea that there is a distinction between people and objects.¹¹ For ANT, the social is formed from the associations and the objective is to reveal the networks that are constituted at all times, referring to the idea of alliances, flows and mediations.¹²

In ANT, the concept of network should be understood in its broadest sense, where each node is established according to its connections, associations and articulations with other nodes in a relational perspective and not individual or one-way.¹³ For Latour, the network is the transportation medium of ANT, "more flexible than the notion of system, more historical than the structure, more empirical than complexity, the network is Ariadne's thread of these confused histories."^{14: 8-9}

Such networks are made up of connected heterogeneous elements, conceptualized by the ANT hosts as Actors (Human and Nonhuman Actors). The term actant: "means all that generates an action, which produces movement and difference ... it is the mediator, the articulator who will make the connection and set up the network in himself and outside himself in association with others. He is the doer."^{15:42} This term is used to break away from the idea of purely human persons or social-actors and, thus, to rediscuss the separation between subject and object made by sociology. Bruno Latour⁵ chooses to use the terms quasi-subjects and quasi-objects to demonstrate that there is no separation between subject and object, but rather a hybridization in which subjects are formed by association with objects and vice versa.

Actant, in the context of ANT, can be tangible (such as a computer, a file, a protocol or people), non-tangible (such as software, information or knowledge) or an interactant, which singles out what or who interacts with the object of study, being part of relations of interaction without one determining the other, although they have the

power to act on each other in the context of a sociology of associations.¹⁶⁻¹⁷

Bruno Latour refers to the origin of the word social, which in Latin means association, in order to establish the sociology of associations, thus proposing the identification of the associations that constitute the connection of several actants in a group, revealing the networks of mediators who structure a particular system: "we live in collectives, not in societies."^{18:222} In the context of ANT, the means that participate in associations in a system can be the mediators (actants) or the intermediaries. At this point, the principle of symmetry applies, according to which actors have the same possibilities of producing interference and mediation, since they are not hierarchical, so a mediator can become an intermediary, just like an intermediary can become a mediator. If a mediator is characterized by whoever or whatever performs an action in the network, an intermediary is one who does not produce modifications in the network, thus placing himself in the background.¹⁹ Thus, an intermediary: "[...] produces no difference, only transports without modifying. He transports (takes from one place to another), but does not transform."^{15:46}

The principle of symmetry means attributing the same relevance to the various components that participate in the same social repertoire, so that humans and nonhumans, subjects and objects have the same degree of importance.¹⁹ In the meantime, the analysis of networks needs to gain a sociotechnical perspective and the circulation in the network plots occurs through translations. The main action among mediators is the notion of translation, so ANT is also known as the sociology of translation.²⁰ This key concept has the philosopher Michel Serres as one of its precursors,²¹ who approached the subject as a translation. The translation concept refers to the idea of communication, contact, or even the creation of a new link that did not exist before and that executes modifications in all agents of the network, generating associations that can be traced.¹³

Translation is acknowledged as the process whose action is always shifted and transformed into another, involving at the same time deviations of route and articulations, in which each element expresses strategies of interests, influences, negotiations, intrigues, calculations, acts of persuasion and other elements in its own language.²² In other words, translation: "does not mean merely changing from one vocabulary to another, but, first and foremost, a displacement, a detour, a mediation or invention of a previously non-existent relationship, and that

somehow modifies the actors involved in it - so that it modifies the network,"^{20:83} It is also important to emphasize that translations are always imperfect, since they mean the local appropriation that each actor does of what circulates in the network. Therefore, there are no right or wrong translations, nor should any translation be taken as indisputable.²⁰

One of the precursors of ANT demonstrates that translation implies similarities and differences. In his representative examples, the author showed that certain artifacts undergo transformations, as they go in a network and according to the interest of the actors involved. Hence, the artifacts can be both reliable as treacherous to ANT and, therefore, translation is also treason.²³ Betrayal in the sense that the same object of study undergoes the intrinsic actions of each actor and each network as, no matter how outlined a particular recipe is, its replication by others will never be exact.

OPERATING ACTOR-NETWORK THEORY THROUGH THE MAPPING OF CONTROVERSIES

Although we speak of an actor-network theory, ANT is also defined as a method to follow and describe the movement of actants and the effects that result from the bonds between them. The researcher who chooses to conduct an ANT research needs to understand the social as the result of constant and unpredictable associations between the actors. Thus, the researcher "should not define in advance what the actors are, nor sort the controversies among them a priori, decide how to solve them or seek explanations."^{16:54} The researcher should compare to a "detective who traces the enigmatic alleys of his investigative case, we must follow the clues that appear at all times."^{24:54}

For ANT, defining pre-established categories by framing the phenomenon before starting the investigation would be like choosing a frame for a canvas before it was drawn or painted. ANT is a way to follow the construction and manufacturing of the facts, with the advantage of being able to produce effects, since what is at stake is not the application of a frame of reference in which we can insert the facts and their connections, but the possibility of following the production of differences.⁵

Thus, the mapping of controversies is considered the operation of ANT. It is described as a set of techniques to explore and visualize controversies, observing and describing social debate, especially - but not exclusively - regarding technical and

scientific problems.²⁵ In the mapping of controversies, instead of a static representation like a map, the objective is to portray a map / landscape that reproduces itself through the intermediary and dynamic movements of the actors (including the cartographer himself).²⁰ The researcher is granted more freedom to access the network registration devices and maintain it as open as possible in the face of the controversy, especially at the beginning of its surveys.¹⁶ An inscription is understood as a form of translation where the association is defined by means of scripts (manuals, protocols, graphs, rules, standards, laws, others), which materialize in an entity of any support, causing the action to be the fruit of hybridism and the production of results.¹⁵

The genesis of mapping has always been linked to human concerns with knowing the world it inhabits. Etymologically, cartography means description of letters, but this initial conception entailed the idea of mapping.²⁶ Studies with cartographic inspiration argue that the researchers should not adopt a position of methodological rigor, but rather maintain a margin of flexibility and provisionality in relation to the objectives and goals of their research. Since this will not compromise their methodological rigor, the cartographic researchers need to incorporate a disinterested look, without focusing on one point, but attentive to everything that is becoming present in the problem context. Mapping does not mean that there are no guidelines, but rather that the way of the research process takes precedence over the goals and objectives of the study.²⁶⁻²⁷

The use of mapping controversies is still recent in Brazil, but its contributions to the areas of social sciences and health have been increasingly recognized internationally. This is due to the fact that mapping is a method that fits well in the common types of research in these areas of knowledge.²⁶ The methodological perspective of objective cartography: "[...] follow processes, rather than represent the state of affairs; intervene in reality, rather than interpret it; set up devices, rather than assigning them any nature; dissolve the point of view of observers, rather than centralize knowledge in an identity and personal perspective."^{26:819}

Venturini,²⁵ one of the collaborators of Bruno Latour in the application of the mapping of controversies, considers that controversies are the most complex phenomenon to be observed in collective life, referring to every piece of science and technology that has not yet been established, closed, using it as a general term to describe the shared uncertainty. The author considers the definition of

controversy to be quite simple, summarizing it in situations where the actors disagree, starting when they discover that they cannot ignore each other and ending when they can make a solid commitment to live together. All controversies share the fact that they involve all types of actors, exhibit the social in its most dynamic form, are reduction-resistant, are debated and have conflicts.

The term controversy can be referred to as "[...] a dispute in which pro or con reasons are claimed, where one can evidence movements whose unfolding will be the achievement of a common goal."^{24:53} The study of the controversies comes from the analysis of the clashes between opposing parties and aims to reveal that there are no pure facts, and information is somewhat neutral. All arguments are part of a game of power, interest and force, which they express through the concreteness the facts are acquiring.

In a simpler way, we can say that controversy is a debate (or controversy) on scientific or technical knowledge that is not yet totally consecrated, and that such objects are called gray boxes,²⁰ and/or unstable and hotter objects.²⁸ Thus, one needs to enter the world of science and technology by the back door, that of the phenomenon under construction, not the analysis of the final products of production, of stable and cold objects of the consolidated phenomenon because, after resolving a controversy, everything is firm in a new black box. Bruno Latour uses cybernetics and borrows the expression black-box to make an analogy to a well-established fact or artifact, given as ready, true, true, and consecrated.²⁸

The concept of black box can be treated as a process of hardening of life in certainties, resulting from agreements between the actors. This process of hardening begins when a statement begins to gain the solidity of a fact whenever it is introduced into new formulations in the condition of unquestionable premise. Still, the solidity of this fact always depends on all those who keep it moving, thus forming a legion of interconnected allies.²⁰ In this context, successive black boxes form the so-called social structure, and "macroactors are microactors seated in the time of many (weak) black boxes."^{29:286} To this end, every actant is a black box and every black box can and should be opened to reveal connections, joints, networks,¹⁵ which reinforces Bruno Latour's argument,⁵ where the author emphasizes that the role of the social scientist is to open the black boxes, to trace the associations and to regroup the social. In this same work, it is also affirmed that the social cannot be studied, neither in its solid format

(the stabilized networks) nor in its liquid format (isolated actors) because, in both cases, the social will disappear.

As Venturini says in *Diving in magma*, the controversies are social in their magmatic state. Since magma is a solid and liquid rock at the same time, such physical states exist in an incessant mutual transformation. On the one hand, the solid rock (black box) is touched by the heat of the flow (controversy), melts and becomes part of it. On the other hand, on the banks of the fluid (controversy), the lava cools and crystallizes (black box). Through this dynamic, the social is relentlessly constructed, deconstructed and reconstructed, that is, the social is always at work.

In this perspective, in order to carry out the tracing of a network and map its connections, a methodology is necessary that allows us to work between the solidity of the hardened facts and their flows. Since the tracking of networks lies precisely in the controversies and the mappings are always provisional, being functional until the moment new mappings are imposed. In order to consolidate a study using the mapping of controversies, it is necessary for the researcher to be able to map the networks in terms of their geography - main actants, spokesmen and their connections - and their dynamics - flows of the different translations. To do so, this task requires a working methodology, where a rather minimalist equipment is convenient for the cartographer, implying little use of theoretical tools conceived a priori. In this approach, what is valued are the observations coming from their insertion and monitoring of the network, carrying in their pocket only a brief itinerary of concerns, and this script is always open to redefinitions.²⁰

For Bruno Latour,²⁸ in ANT, seven methodological rules are necessary, whose negligence would lead to a loss of course in relation to the monitoring of networks or collectives. These rules show us that the tracing of network extensions is intrinsic to the controversies whereas, amidst controversial plots, their connections are exposed and we can see that the actants are always notes of much more vast and heterogeneous networks.²⁰ Such notes are understood as all phenomena that produce effect or are products of heterogeneous networks. By means of the resources noted, networks can be mobilized and used quickly without direct involvement with endless complexities.¹¹ In the meantime, the analysis of the controversies can be considered a tool of singular importance to map the networks that articulate humans and nonhumans

and such a tool is in tune with the assumption that experimental procedures and objective rules are not sufficient to resolve disputes about facts.²⁰ Thus, we need to proceed and describe the evidence and the fluid connections that build the production process of existence, based on the traces left by the mediators, moving slowly from translation to translation.⁵ To this end, Pedro²⁰ relies on Bruno Latour,²⁸ to outline four minimal movements for a researcher-cartographer, presented below.

“Finding a gateway - You have to find a way to ‘get in the network’, to start following the actors and, somehow, to participate in the dynamics that your movements can trace.”^{20:90} As mapping is produced from the movements of the actors, it will always be provisional. Therefore, when identifying a way to enter the network, we need to pay attention to the right moment to enter through the back door of the phenomenon under construction. In one study, in which the controversies established between the conception of human life and the new biotechnologies of reproduction were mapped out, the mainstream media was conceived as a unique gateway.³⁰ In another study, the gateway into the network, materialized from the mobilization of some people around the formation of a Non-Governmental Organization that, among other objectives, was intended to develop a community space for people affected by the human immunodeficiency virus.³¹

“Identifying Spokespersons - As multiple human and non-human actants participate in the network, it is necessary to identify those who ‘speak through the network’, and who end up synthesizing the expression of other actants. In this process, it is worth emphasizing that one should not try to search for ‘discordant voices’, that is, the recalcitrance that also circulates in the network.”^{20:90} In the process of following the actors, the cartographic researcher needs to embody the principle of generalized symmetry and investigate the influence that each actor generates in the network, to catalog it - even if momentarily - as a mediator or intermediary. This spatial mapping of the network makes it possible to identify its notes, which may be promising or discordant from the current process. In the case of the mainstream media, as a singular gateway, it is also possible to choose it as the main spokesperson - as a locus of visibility of the controversies about human life.³⁰ This choice was made by amplifying the information that the media can produce in the connection of the citizen to the networks that articulate the theme. Recently, in a map of the production processes of what is

currently understood by body health, steroids, plastic surgeries, chemistry, statistics, professional advice, public policies, the mass media, production and circulation of academic articles, capital, pharmaceutical industries, gyms, among others, were presented as mediators.³²

“Access to the registration devices, that is, everything that permits a visual display, of any kind, in texts and documents, and that makes it possible to ‘objectify’ the network.”^{20:90} Any products (regiments, graphs, documents, interviews, questionnaires, photographs, informal conversations, among others) that materialize the information collected in the research field. In a study on integrative and complementary practices, we used the document World Health Organization’s Strategy on Traditional Medicine 2002-2005 and the National Policy on Integrative and Complementary Practices of the SUS, as registration devices.³³ In addition, participant observation can also be used, conciliated with photographic records and interviews as registration devices. This strategy was used in the daily study of people living with the human immunodeficiency virus.³¹

“Map the associations between actants. It is a matter of outlining the relations that are established between the different actors and that end up composing the network. It involves the multiple translations produced by the actors, emphasizing their articulations, particularly: the synergy or cooperation effects in the network; the effects of chaining or passing through the network; the crystallizations or limitations of the network.”^{20:91} In order to outline the network of the investigated phenomenon, the researcher should not define the actors previously nor sort the controversies between them a priori, let alone decide how to solve them or search explanations. Without the pretension to exhaust all of the actors to follow, the researcher has to describe how they articulate and only then find a certain sense of order in the data collected. The fourth movement can be exemplified based on the finding that the Integrative and Complementary Practices within the Brazilian Unified Health System are an Actor-acted that: “move and are moved by policies, documents, practices, heterogeneous relationships, academic writings, professional class disputes, doubts in professionals and SUS users regarding the ontology about what health and care lead to.”^{33:178} We can also illustrate another study, which after mapping the translations among the network actors of people affected by the human immunodeficiency virus, concluded that, in complying with AIDS treatment, the remedy is the least of the problems.³³

It is also important to highlight that the peculiar spatiality and temporality of the networks are crucial for the study of groups, outlined based on the mapping of controversies.²⁰ The spatiality remits to the need to investigate how the network draws its own lines, that is, the way in which each actor translates his accomplishments in terms of the connections established and what obstructs these flows, stabilizing the network movements. As for the temporality, when the actors’ translations are monitored, an approach is noted between what the timeline would show as very distant and, at the same time, a distancing between exactly consecutive things. Consequently, both expressions are detached from the metric, linear, well-defined and stable commitments of metric geometrics, allowing the research to focus on the spaces of mediations, spaces where the transformations and/or dislocations take place.²¹

CONCLUSION

The constant (r)evolutions in work, strengthened by the technical-scientific advances, demands new possibilities to interpret the social. Hence, in the belief that knowledge is a social product or effect of a network of human and non-human actors, instead of something that is produced through the operation of a privileged scientific method, the Actor-Network Theory figures as a promising theoretical-methodological framework for controversial environments, in different knowledge areas, which is no different for health and nursing research.

The four minimal movements for a cartographic researcher help to reaggregate the social, also in the scope of health and nursing research, where humans and non-humans interact and produce effects that circulate in the group, in simple or complex contexts as well as at macro or micro levels.

REFERENCES

1. Cavalcanti MFR, Alcadipani R. Organizações como processos e Teoria Ator-Rede: a contribuição de John Law para os estudos organizacionais. *Cad EBAP* [Internet]. 2013 Dec [cited 2017 Feb 07]; 11(4):556-68. Available from: <http://www.scielo.br/pdf/cebape/v11n4/06.pdf>
2. Booth RG, Andrusyszyn MA, Iwasiw C, Donelle L, Compeau D. Actor-Network Theory as a sociotechnical lens to explore the relationship of nurses and technology in practice: methodological considerations for nursing research. *Nurs Inquiry* [Internet]. 2015 [cited 2017 Feb 07]; 23(2):109-20. Available from: <https://dx.doi.org/10.1111/nin.12118>

3. Cerretto C, Domenico SMR. Mudança e Teoria Ator-Rede: humanos e não humanos em controvérsias na implementação de um centro de serviços compartilhados. *Cad EBAPE* [Internet]. 2016 [cited 2017 Feb 07]; 14(1):83-115. Available from: <https://dx.doi.org/10.1590/1679-395131385>
4. Chen J. Education as networking: rethinking the success of the harm reduction policy of Taiwan. *Health* [Internet]. 2015 May [cited 2017 Feb 07]; 19(3):280-93. Available from: <https://dx.doi.org/10.1177/1363459314545697>
5. Latour B. Reagregando o social: uma introdução à teoria do Ator-Rede. Salvador-Bauru: EDUFBA-EDUSC; 2012.
6. Fornazin M, Joia L. Remontando a rede de atores na implantação de um sistema de informação em saúde. *Rev Adm Empres* [Internet]. 2015 [cited 2017 Feb 07]; 55(5):527-38. Available from: <http://dx.doi.org/10.1590/S0034-759020150505>
7. Soratto J, Pires DEP, Dornelles S, Lorenzetti J. Family health strategy: a technological innovation in health. *Texto Contexto Enferm* [Internet]. 2015 Jun [cited 2017 Feb 07]; 24(2):584-92. Available from: <http://dx.doi.org/10.1590/0104-07072015001572014>
8. Cross BL, Macdonald M. Developing a relationship with the computer in nursing practice: A Grounded Theory. *CJNR* [Internet]. 2013 [cited 2017 Feb 07]; 45(1):114-37. Available from: <http://www.ingentaconnect.com/content/mcgill/cjnr/2013/00000045/00000001/art00011>
9. Evarts S. Translating the translators: following the development of Actor-Network Theory [tese]. Providence (US): Brown University, Development Studies Program; 2011.
10. Bilodeau A, Potvin L. Unpacking complexity in public health interventions with the Actor-Network Theory. *Health Promot Int* [Internet]. 2016 Aug [cited 2017 Feb 07]; 1-9. Available from: <https://doi.org/10.1093/heapro/daw062>
11. Law J. Notes on the theory of the Actor-Networking: ordering, strategy and heterogeneity. *Systems Practice* [Internet]. 1992 [cited 2017 Feb 07]; 5(3):379-95. Available from: <http://www.heterogeneities.net/publications/Law1992NotesOnTheTheoryOfTheActorNetwork.pdf>
12. Lemos ALM, Rodrigues LPB. Internet das coisas, automatismo e fotografia: uma análise pela Teoria Ator-Rede. *Rev Famecos*. [Internet]. 2014 [cited 2017 Feb 07]; 21(3):1016-40. Available from: <http://dx.doi.org/10.15448/1980-3729.2014.3.18114>
13. Oliveira KEJ, Porto CM. Educação e teoria ator-rede: fluxos heterogêneos e conexões híbridas. Ilhéus (BA): Editus; 2016.
14. Latour B. *Jamais fomos modernos: ensaio de antropologia simétrica*. Rio de Janeiro (RJ): Editora 34; 1994.
15. Lemos A. *A comunicação das coisas: teoria ator-rede e cibercultura*. São Paulo (SP): Annablume; 2013.
16. Lopes PMA, Melo MFAQ. O uso das tecnologias digitais em educação: seguindo um fenômeno em construção. *Psicol Educ* [Internet]. 2014 [cited 2017 Feb 07]; 38(1):49-61. Available from: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1414-69752014000100005&lng=pt&nrm=iso
17. Gardner J, Cribb A. The dispositions of things: the non-human dimension of power and ethics in: patient-centred medicine. *Sociol Health Illn* [Internet]. 2016 Sep [cited 2017 Feb 07]; 38(7):1043-57. Available from: <https://dx.doi.org/10.1111/1467-9566.12431>
18. Latour B. Um coletivo de humanos e não humanos: no labirinto de Dédalo. In: Latour B. *A esperança de Pandora*. Bauru (SP): Edusc; 2001.
19. Callon M. Some elements of a sociology of translation: domestication of the scallops and the fisherman of St Brieuc Bay. In: Law J. editor. *Power action and belief a new sociology of knowledge*. Londres (UK): Routledge; 1986.
20. Pedro R. Sobre redes e controvérsias: ferramentas para compor cartografias psicossociais. In: Ferreira AAL, Freire LL, Moraes M, Arendt RJJ, organizadores. *Teoria Ator-Rede e psicologia*. Rio de Janeiro (RJ): Nau; 2010.
21. Serres M. *Luzes - cinco entrevistas com Bruno Latour*. São Paulo (SP): Unimarco; 1999.
22. Potvin L, Clavier C. Actor-Network Theory: the governance of intersectoral initiatives. In: Clavier C, De Leeuw E. editor. *Health Promotion and the Policy Process* [Internet]. Oxford (UK): Oxford University Press; 2014 [cited 2017 Feb 07]. Available from: <http://dx.doi.org/10.1093/acprof:oso/9780199658039.003.0005>
23. Law J. Traduction/Trahison: notes on ANT. *Convergencia* [Internet]. 2006 [cited 2017 Feb 07]; 13(42):47-72. Available from: <http://www.lancaster.ac.uk/fass/resources/sociology-online-papers/papers/law-traduction-trahison.pdf>
24. Nobre JCA, Pedro RMLR. Reflexões sobre possibilidades metodológicas da Teoria Ator-Rede. *Cad UniFOA* [Internet]. 2010 Dec [cited 2017 Feb 07]; 14(4):47-56. Available from: <http://web.unifoa.edu.br/cadernos/edicao/14/47.pdf>
25. Venturini T. Diving in magma: how to explore controversies with Actor-Network Theory. *Public Understanding of Science* [Internet]. 2010 [cited 2017 Feb 07]; 19(3):258-73. Available from: <http://journals.sagepub.com/doi/abs/10.1177/0963662509102694>
26. Souza SRL, Francisco AL. O método da cartografia em pesquisa qualitativa: estabelecendo princípios... desenhando caminhos... Atas CIAIQ [Internet]. 2016 [cited 2017 Feb 07]; 2:811-20. Available from: <http://proceedings.ciaiq.org/index.php/ciaiq2016/article/view/826>
27. Passos E, Kastrup V, Tedesco S. Organizadores. *Pistas do método da cartografia: a experiência da pesquisa e o plano comum*. Porto Alegre (RS): Sulina; 2014.

28. Latour B. *Ciência em ação: como seguir cientistas e engenheiros sociedade afora*. São Paulo (SP): UNESP; 2000.
29. Callon M, Latour B. Unscrewing the Big Leviathan; or how actors macrostructure reality, and how sociologists help them to do so? In Knorr K, Cicourel A. Eds. *Advances in social theory and methodology*. Londres (UK): Routledge e Kegan Paul; 1981.
30. Nobre JCA, Pedro RMLR. Vida humana, mídia e mercado: uma perspectiva sociotécnica das pesquisas com células tronco embrionárias. *Estud Pesqui Psicol* [Internet]. 2014 [cited 2017 Feb 07]; 14(1):320-36. Available from: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1808-42812014000100018
31. Rossi OS, Pereira PPG. O remédio é o menor dos problemas: seguindo redes na adesão ao tratamento de aids. *Saúde Soc* [Internet]. 2014 Jun [cited 2017 Feb 07]; 23(2):484-95. Available from: <http://dx.doi.org/10.1590/S0104-12902014000200010>
32. Nobre JCA, Oliveira IRS, Mendes TB, Corrêa AS, Leite VF. Corpo e saúde: uma controvertida produção coletiva. *Cad UniFO* [Internet]. 2016 Aug [cited 2017 Feb 07]; 31:59-73. Available from: <http://web.unifoa.edu.br/cadernos/ojs/index.php/cadernos/article/view/392>
33. Santos MA. Práticas integrativas e complementares no Sistema Único de Saúde do Brasil: inusitadas mediações. *Pesqui. Prát Psicossociais* [Internet]. 2016 [cited 2017 Feb 07]; 11(1):176-84. Available from: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S180989082016000100014&lng=pt&nrm=iso