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Abstract

Nurse Practitioners (NPs) are clinically effective and safe. They positively influence patient outcomes, and they increase access to care while decreasing health care costs. Despite these significant benefits, NPs can seldom practice to their full scope and often experience interprofessional tensions. The supposed lack of clarity around NPs' role is often cited as a barrier to seamless integration, despite clear legal and professional delineation. We suggest other factors are at play within the Canadian health care system that explain why, after almost four decades, NPs' full involvement as equal health care partners and their job satisfaction remain modest at best. New, critical frameworks are needed to uncover the various contingencies that mediate their integration process. This paper explores how Actor-Network Theory (ANT) can provide such a framework to analyze contemporary issues in advanced nursing practice. ANT's main concepts are explored along with their applicability to an examination of NPs' integration in the Canadian health care system.

Key Words actor-network theory, advanced practice nursing (APN), interprofessional collaboration, nurse practitioner, primary care, role integration

Exploring the Potential Contribution of Actor-Network Theory in Nursing Using the Integration of Nurse Practitioners as an Exemplar

ANNIE RIOUX-DUBOIS & AMÉLIE PERRON

Introduction

In North America and elsewhere, advanced practice nursing (APN) is at the heart of health restructuring and reforms. Despite emerging as a distinct specialty 45 years ago, and even though scientific studies have clearly established their effectiveness and efficiency, advanced practice nurses, which include nurse practitioners (NPs), are not used to the full extent of their knowledge, skills and capabilities.[1] Research consistently shows that NPs are clinically effective and safe; that they positively influence patients' health outcomes; that

they increase access to quality care as well as decrease health care costs.[2] Despite these significant impacts, studies suggest that NPs often experience interprofessional conflicts within clinical settings, which often results in them not being able to practice to their full scope. According to two studies (one American, one Canadian), this has led to significant numbers (approximately a quarter) of NPs intending to leave their position due to dissatisfaction with professional growth, intrapractice partnerships, and collegiality.[3,4] In fact, according to the Canadian Nurse Practitioner Initiative[5], autonomy, support, clarity, collaboration and practicing at full scope are key elements for maintaining NPs' workplace satisfaction, and of great importance as they directly correlate with patient satisfaction.[6]

A number of studies have explored various models and processes for the successful integration of nurse practitioners (see for example [1,7,8,9]), yet significant issues remain, including a persistent belief that NP roles lack clarity, which purportedly explains the lack of NP integration and interprofessional conflicts. However, we contend

instead that professional role socialization, negotiation and integration are far too complex to be reduced to mere role ambiguity. Uncritical approaches to research on NPs have left us with linear explanations. Perhaps it is time to examine issues surrounding NP integration from a different angle.

APN is paradoxically positioned at the juncture of divergent, changing, and sometimes conflicting discourses focusing on professional scope of practice, access to health care, patient safety, economic benefits, and professional autonomy, which may explain why the integration of NPs across various health settings remains inconsistent. We suggest that a complex assembly of networks of actors and actants are formed and transformed through the integration process of NPs in primary health care. Actor Network Theory (ANT) has been proposed as being capable of delineating and describing such forces in action.

This manuscript will offer a detailed description of ANT, its main concepts, and its epistemological and ontological commitments. It will then present a preliminary application of ANT concepts to the issue of NP role integration in Canadian primary health care settings. A more detailed analysis will be published separately.

Frequently cited issues regarding nurse practitioners' roles and scope of practice

In the 70s, the Canadian federal government launched the NP role across most provinces, mainly in rural areas.[10] At the time, a few studies had already established the efficacy and safety of NPs' practice.[9,11,12] Despite this support, the next decade saw the near complete elimination of NPs, which some authors attribute to increased medical workforce and the lack of legislative support and political will on the part of decision makers.[10,13,14] The reinvigoration of primary health care (PHC) following the Lalonde[15] and Romanow[16] reports, as well as the creation of the Ottawa Charter[17] led to the adoption of concrete legislative measures and the reinstitution, in the mid to late 90s, of NPs in the Canadian health care system. Today, despite an ever growing number of studies that confirm NPs' contribution to health care, there remain multiple hurdles to their integration; their scope of practice varies greatly across provinces and settings; and a number of reports that discuss the future of Canada's health system do not include them as key players who contribute to its quality and sustainability (see for instance [18,19]). Some scholars also argue that their integration is heavily "dependent on the changing political agendas shaping the health-care system".[10 p6]

Though it is beyond the scope of this paper to review the

detailed history of NPs in Canada, a cursory view suggests that such uneven implementation process reflects the extent to which NPs' position in the health care system is not assured, and they remain subject to shifting discourses, priorities, hopes and anxieties that at times create an environment that is conducive to NP integration, and at times less so. In this paper, NP integration refers to:

> the extent to which NPs within a program or team setting are enabled to fully enact the scope and intent of their role in order to contribute effectively to client care … NP role integration at the program–team level relies on collaborative efforts by the leadership and team members to constitute the NP role as essential to PHC delivery.[20 p100-101]

Several barriers to NP integration have been cited in the literature, including: lack of political frameworks to promote and safeguard NP autonomy, lack of monetary resources or incentives to support NP positions, role ambiguity, uneven acceptance and collaboration within teams, lack of performance indicators that specify NPs' contribution to health services, medical interference, and lack of administrators' involvement and will to address these issues.[9,20,21,22,23,24] Hamric[25] asserts that various matters, such as managerial aspects of care, political issues, remuneration schemes, organisational cultures, marketing strategies, laws, and credentialing issues, significantly affect APN. Such issues have been described in various ways. Here, we are interested in the organisational, discursive, political, and historical links that bind these issues together and create a particular reality for NPs.

The configuration of clinical settings is thought to strongly influence NP integration outcomes.[4] In Ontario, Canada, there exist four models of primary health care services: Fee-For-Service, Community Health Centers (CHC), Family Health Teams[26] and NP led-clinics (NPLC). Health services governance structure is typically physician-led. CHCs, however, are community-based, and NPLC are, as their name indicates, governed by NPs. Such organizations vary greatly in terms of management models, vision and mission, thereby shaping the range of NP practice and decision-making power. Furthermore, since their scope of practice can significantly overlap with that of family physicians' and some specialists', it has been suggested that the introduction of NPs in a clinical setting may lead to interprofessional conflicts arising from resistance to change and, in some cases, the maintenance of medical stronghold over decision making, particularly in physician-led institutions.[27] This perspective is influenced by the common view that nursing is a subordinate profession[28] and that health care systems

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are hierarchical in nature.[29] NP role integration does not mean the sole development of a new professional role; it also involves the need to navigate a complex, sometimes positive, sometimes hostile, environment that can react in various ways to organisational and professional culture changes.[30]

In primary health care in particular, interprofessional teamwork is typically described as key to ensuring successful NP integration[29], hinging on strong collaborative ties that facilitate the negotiation of scopes of practice. [13,14,31] Yet, according to one Australian study, "total" collaborative relationships do not characterize most clinical settings[32], suggesting that health care teams continue to function according to particular, and sometimes antiquated, organizational structures and conventions.[29] Interestingly the concept of integrated teams is not necessarily problematized in such analyses, and they are often treated as an absolute entity.

NP integration within health systems is highly complex.[9] Yet this particular process is not studied extensively. Rather, outcomes of NP care, patient satisfaction and barriers to NP integration remain the most commonly researched topics relating to NP practice.[24] Integration is a longitudinal phenomenon subjected to forces that go well beyond the sole will, agency and subjectivity of individual players. The global and local realms are therefore closely connected across settings and across interactions. Examining the intricacies of these connections may provide additional insights into the way NP integration occurs (or not) in current health systems. Actor-Network Theory is specifically focused on the study of such interactions and relationships.

Theoretical considerations: Bruno Latour & actor-network theory

Actor-Network Theory (ANT), borne out of the sociology of science and technology, was proposed in the 1980s, not as a theory per se, but as a methodology for exploring the interplay of those domains that have come to be defined as "society" and "technology". It stems from the work of Bruno Latour, Michel Callon and John Law, who have proposed a relational epistemology that rejects the notion of a pre-existing, essential actor who acts on his own free will. The indeterminacy of the actors sets ANT apart in that it moves beyond usual considerations afforded by realism and social constructionism as distinct paradigms. ANT is defined as such:

> A disparate family of material-semiotic tools, sensibilities and methods of analysis that treat everything in the social and natural worlds as a continuously generated effect of the webs of relations within which they are located. It assumes that nothing has reality or form outside the enactment of those relations. Its studies explore and characterise the webs and the practices that carry them.[33 p141]

As an anti-essentialist frame, ANT rests on and defends a relational epistemology, according to which one cannot presuppose prior existence, purpose or functionality of any thing. As such, rather than use "social elements", such as race or gender, to explain phenomena, one should limit oneself to a description of what makes these elements "social" in the first place. Inspired by ethnomethodology, ANT aims for the description, rather than the explanation, of "society", whereby human, technological, and discursive actors come together in the form of complex and often far-reaching networks.[34]

ANT suggests that facts are engineered, thus repositioning conventional understandings about science, politics, society, technology, nature and modernity.[35] A fact is tied to its history of production that can be verified through historical and empirical studies, for example by collecting data about activities taking place within the confines of the laboratory whence it comes. Scientists therefore construct the social, historical and political world, a view that strongly contrasts with dominant discourses of philosophy of science.

ANT does not reproduce common ontological assumptions about taken-for-granted dualisms, such as subject/object, nature/culture, reason/emotion, self/other, etc.[34] A Latourian perspective makes it possible to bring together all of those entities, such as nature and society, that Modernism had carefully taken apart, without further emphasizing those differences that supposedly makes them incommensurable. To do this, Latour introduces the concept of hybridization, which runs counter to the modernist differentiation project. Through hybridization, elements are connected and networked into a complex interplay that forms the world, regardless of the nature of such elements (discursive, technological, human, etc.). The network rests on the reciprocal associations that bind these elements to one another. Such associations are the crux of ANT's relational ontology. In Latour's view, there is nothing other than networked collectives: no essence, no underlying factors or predispositions, no contexts.[35] The world is made up of nodes and connections laid out in a single plane, so much so that not one is more sociologically significant than the others. In order to better understand Latour's thinking, it is important to explain some of his core concepts, in particular: the social, actors/actants, network and translation.

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The social

Commonly understood as the very foundation of sociology, the social is, according to Latour, everywhere and nowhere at the same time.[36] Latour critiques traditional sociology, which he names sociology of the social, because it typically targets social structures, social difference and social order notions that have dominated sociological theory since Émile Durkheim[35] as though they exist in and of themselves, as though they function with and respond to intrinsic rules and regulations. The problem with the term social, however, is that it automatically binds the reader or the researcher to normative discourses about, and representations of, what is "not social". Latour wishes specifically to eliminate the ensuing bias that dictates what is worth analyzing sociologically and what is not. As a result, he calls for a radical shift of perspectives, in the shape of what he calls the *sociology of associations*.

Sociology of associations turns conventional sociology on its head, namely by effectively circumventing habitual dichotomies that are deemed to be inevitable: macro/micro, agency/structure, technology/society, nature/culture, global/local, individual/group, etc. Such dichotomies restrict the realm of sociological analysis by excluding an array of elements from review. For example, discussing technology as an entity that is separate from society leaves out crucial details about how society forms, extends itself, and acquires meaning through technologies. Sociology of associations argues instead that technology does not exist outside of society, and that it is inherently 'social'. This view promotes an understanding of the world as a hybrid configuration of complex associations between entities that have historically been divorced and placed in opposition to one another. In this sense, Latour proposes a "flat ontology" where any and all actors occupy the same plane and where no nature, agency, structure, intention, animation, meaning or essence can be presumed. Any and all bear the same sense of existence, which boils down to their ability to generate relationships and connections with others and to react to these others.

The social now refers to "a movement, a displacement, a transformation, a translation, an enrollment. It is an association between entities which are in no way recognizable as being social in the ordinary manner, *except* during the brief moment when they are reshuffled together". [36 p64-65, italics in original] This notion of the social does not imply the fragmentation of society into individual actors, but rather the replacement of the term *society* with the notion of *collective*.[35] Latour[36] echoes Gabriel Tarde, who also remarked that society, on its own, explains nothing; instead, it should be the product of one's explanations. Society from a traditional sociological perspective predisposes one to an assumption of stability and naturalness, something that Latour vehemently opposes. In *Pandora's Hope*, he contends that:

> Unlike society, which is an artifact imposed by the modernist settlement, [collective] refers to associations of humans and nonhumans. While a division between nature and society renders invisible the political process by which the cosmos is collected in one livable whole, the word "collective" makes this process central.[37 p304]

To avoid the pitfalls of comfortable, convenient dualistic abstractions, Latour suggests using the terms actor and actant to keep open the descriptions about possible sources of actions.

Actor/actant

According to Latour[36 p71, italics in original], "any thing that does modify a state of affairs by making a difference is an actor". Conventional sociology would rather describe an actor as an individual, a corporation or a social unit capable of initiating and performing any form of action borne out of intention – a misleading designation according to Latour, since, in his view, an actor does not act; it is what is made to act:

> [In ANT] the word actor directs our attention to the complete dislocation of the action, warning us that it is not a coherent, controlled, well-rounded, and clean-edged affair. By definition, action is *dislocated*. Action is borrowed, distributed, suggested, influenced, dominated, betrayed, translated… it represents the major source of uncertainty about the origin of action.[36 p46, italics in original]

Actors, then, need not be animate; therefore, objects can be full-fledged actors, rather than mere props for social action. Whether entities are 'social', 'discursive', or 'technological' in nature is irrelevant: what matters is the shape and outcome of their action.[36] An actor reacts to something. Therefore, for Latour[36 p. 46], an actor is "not the source of an action but the *moving target* of a vast array of entities swarming toward it". Latour illustrates this point using the example of an artist on stage who cannot perform without spotlights, sound technicians, scripts, spectators, curtains, makeup, emotions, prompters, costumes, and so on. Latour[36] notes that one can (and should) follow the trail of non-human entities as long as one lets go of the ontological assumption that they are any different from humans. This does not mean however that their respective features are to be dismissed:

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> Often in practice we bracket off non-human materials, assuming they have a status which differs from that of a human. So materials become resources or constraints; they are said to be passive; to be active only when they are mobilized by flesh and blood actors. But if the social is really materially heterogeneous then this asymmetry doesn't work very well. Yes, there are differences between conversations, texts, techniques and bodies. Of course. But why should we start out by assuming that some of these have no active role to play in social dynamics?[38 p168]

> In abandoning dualism our intent is not to … efface the distinct features of the various parts within the collective. …The name of the game is not to extend subjectivity to things, to treat humans like objects … but to avoid using the subject-object distinction at all in order to talk about the folding of humans and nonhumans. What the new picture seeks to capture are the moves by which any given collective extends its social fabric to other entities.[37 p193-194, italics in original]

Actors come into networked associations, which provide them with characterization, motivation, and subjectivity. They are inherently unspecified, with no a priori essence. It is through networks that they acquire substance, as well as the opportunity to act. They are not able to act if they are not part of a broader configuration (a network) of other entities that prompt and channel their actions. The network is a key component of ANT.

Network

A network is "a group of unspecified relationships among entities of which the nature itself is undetermined" [39 p263]. It is made of relationships and nodes, whereby nodes can be networks in and of themselves. It is important to reiterate the notion that actors cannot be 'actors' outside of a network configuration; similarly, networks are made of actors brought into relations with other actors. Actors and networks, then, need each other to constitute one another and confer meaning and substance to one another. The relationships that constitute any network are semiotically derived, giving networks a highly contingent and localized quality, yet their substance, meanings and effects can transcend space and time.

Though Latour was concerned about improper use of the term "network", he insisted that the concept is highly appropriate since it does not attempt to create relational hierarchies. The term network thus remains useful because

> It has no a priori order relation; it is not tied to the axiological myth of a top and of a bottom of society; it makes absolutely no assumption whether a specific locus is macro- or micro-.[40 p5]

Networks have no beginning and no end. They seek a certain degree of equilibrium, which provides longevity, yet they are subjected to continuous tension from within and without. They therefore undergo continuous de-forming and re-forming processes, which lend them a dynamic quality. The actor-network theorist's task, then, is to examine how networks come to be formed, how they enrol actors and bring them to endorse particular interests and objectives, how they acquire consistency, stability, functionality and purpose, and how they become indispensable. These features of the network are dependent upon what Latour calls translation processes.

Translation

Translation is understood as the displacement of actors and interests in such a way that an actor can act for another or for a collective.[41] Through translation, actors are mobilized and brought together. Their interests, which may have been disparate and unrelated initially, may converge and become aligned, thus providing further stability to the network. Translation is key in understanding how supposedly commonsensical, essential distinctions between certain realms are groundless. Latour[37] illustrates this point by describing how seemingly unconnected decision makers and atomic particles are actually tightly bound and share common grounds and objectives. No definition of the social in any traditional sociology text can accommodate these disparate entities together in one statement. Yet, as Latour explains, in the years prior to World War II, complex dealings leading to the invention of the atomic bomb brought together politicians, who made public funds available for this project, and complex chain reactions that led to the splitting of an atomic nucleus, without which no fission bomb could be created. Translation movements are what makes possible the joining of two apparently heterogeneous and distant realms: in this case, the 'political' and the 'scientific'. According to Latour[37 p88], "[t]o call the first ambition "purely political" and the second "purely scientific" is completely pointless, because it is the "impurity" alone that will allow both goals to be attained". Translation, then, rests on mobilization and enrolment of diverse actors and actants. As translation progresses, actors transform and configure one another, co-opt one another in the delineation or defense of particular objectives, which then in turn modifies and configures the network. Alignment of interests through translation therefore allows the network to become consistent and intelligible, despite the heterogeneity of its components. Rather than assuming and studying the existence of any network (e.g. person, group, organization), the task of the sociologist of

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translation is to outline these processes of translation.

Examining the concept of translation, and the accompanying reshuffling of entities, motivations, interests, and identities, helps to further understand why, in Latour's view, traditional definitions of the social are not adequate:

> Another notion of social has to be devised. It has to be much wider than what is usually called by that name, yet strictly limited to the tracing of new associations and to the designing of their assemblages. This is the reason why I am going to define the social not as a special domain, a specific realm, or a particular sort of thing, but only as a very peculiar movement of re-association and reassembling.[36 p7]

'Reassembling the social', as Latour[36] calls it, involves tracing the making and unmaking of an infinite number of networks that are understood as playing a 'social' role, whether 'political', 'scientific' or 'technological'. Such networks extend and connect to other (often black-boxed) networks through multiple (discursive, physical, biological, chemical, etc.) connections and translations, rather than entities that exist and acquire meaning in and of themselves. Such expansive configurations confer increased stability and durability to networks, as well as an ability to generate far-reaching effects. The stability, rather than the power, of a network is therefore explained by its scope, rather than some presumed macrosystem that holds it in place.

ANT moves beyond traditional sociological constructs, such as micro- and macrosystems, and inhibits the mental construction of so-called social strata, systems or hierarchies that fragment and compartmentalize the world according to particular ontological features. Latour suggests instead that we localize the global: "Instead of having to choose between the local and the global view, the notion of network allows us to think of a global entity – a highly connected one – which remains nevertheless continuously local".[40 p5] The notion of networks allows for renewed malleability and fluidity of sociological analyses that is hindered if the use of dualisms (micro/macro, local/global, etc.) persists.

Latour critiques the tendency for social explanation and promotes instead descriptions of the social. Though widely considered as an unsophisticated, insufficient and somewhat useless approach by many researchers, funding bodies, policymakers, and scientific journals, the description of the social is precisely where traditional sociology has failed, according to Latour, because sociologists "have simply confused what they should explain with the explanation. They begin with society or other social aggregates, whereas one should end with them".[36 p8]. This means that, rather than use certain 'explanatory' concepts such as violence,

hope or knowledge, sociologists should work to describe these notions and what bestows a 'social' quality upon them. This is so, because social explanations involve the imposition of the researcher's own representations on particular matters, thereby stunting social movements. Social description, on the other hand, allows these movements to occur and produce social effects. One should be wary, then, of any presumed intellectual dominance of researchers over the very matters and persons they seek to investigate. This caution extends to critical researchers as well. In this sense, Latour seeks to reconcile constructivism (rather than social constructionism), critical social theory and what could be termed the "participatory paradigm".

As mentioned earlier, Latour criticizes those perspectives that discredit non-human entities by portraying them as "visibly invisible" and, therefore, unimportant. According to him, such entities "act" to the same *degree* (though not in the same *way*) as humans do, because they can enable (and disable) action. There is therefore a social compatibility between persons, technological and semiotic entities. Echoing Latour, Karsenti and Porter[42] argue that technologies, much like science, evolve in their own world, filled with organisations, negotiations and even morality. Scientific investigations, then, cannot afford to dismiss them. Since categorizing social structures is no longer relevant, other questions must then be asked by researchers who wish to unravel the ways in which the social comes into being:

> Which agencies are invoked? Which figurations are they endowed with? Through which mode of action are they engaged? Are we talking about causes and their intermediaries or about a concatenation of mediators?[36 p62]

Latour's approach undoubtedly opens up new research possibilities. It has been used as a framework in studies from various disciplines other than sociology, including information technology, accounting, and biology, to name those few. Despite being widely used in other disciplines, ANT is not common in nursing scholarship. Very few authors have applied the theory effectively to explore issues of importance to nursing. For example, Mary Ellen Purkis[43] has used ANT to examine the managerial practices that shape home nursing care, showing the means by which some practices are made visible and other invisible. Clinton Betts[44] has used ANT as a philosophical alternative to postpositivist epistemology in the context of illicit drug use and harm reduction in nursing, arguing for a political ontology of nursing: 'the reality is political (…) and constructed by (democratic) due process rather that short circuited (…) by a modernist use of things like knowledge, evidence,

research, science, efficiency, effectiveness'.[44 p270] More recently, Thomas Foth[45] rendered a complex and interesting portrayal of the interplay of different entities, such as patient records, in the networks of psychiatric practices in 1931-1945 Germany, thus enlightening the normalization process that led nurses to partake in acts of killing. In the field of medical sociology, Annemarie Mol[46] explored the ethnographic applications of ANT to provide multiple readings of the body and bodily ailments that are generally thought of as commonplace.[46,47] Vicky Singleton has explored the ambiguity and ambivalence of various actors in public health programmes directed at women.[48] These examples show how ANT has had fruitful applications within critical health studies and how it could contribute to nursing scholarship. The scarce use of ANT in nursing is unfortunate, given that nursing scholars have all endeavoured, one way or another, to conceptualize, describe, model, explain, theorize, and represent various aspects of nursing care using social constructs, such as groups (e.g. at-risk youth; palliative patients) or concepts (e.g. resilience, race, stigma, health care organizations). Furthermore, ANT was developed in order to reconcile those entities that have traditionally been cast in different ontological categories, such as humans and technology. Given nursing's proximity with technology, nursing research questions lend themselves particularly well to innovative analyses using ANT. This, however, does not preclude the possibility of investigating nursing issues in which technology plays a less prominent role, though one quickly realizes that technology – any technology – mediates much, if not most, of "health work". ANT is useful for a range of topics that problematize traditional historical, social, and ontological distinctions in health-related matters. However, it has not yet been put to work to understand issues arising from NP integration efforts. In the next section, we wish to suggest ways is which ANT could be applied in exploring PHC NP nurse practitioners' integration.

Using ANT to explore NP role integration in primary health care

Various models and processes have been used for the successful integration of nurse practitioners (see for example [1,8,9,30]). Research to date on NPs integration within a healthcare system has therefore favoured organisational and social explanations, especially as regards facilitators and barriers to integration. However, ANT affords a very different kind of sensibility – or relation – to nurses and nursing. Researchers have not yet considered using the concept of network to *describe* (rather than *explain*) how various entities come together to form what is socially understood

as a "health care system", "multidisciplinary teams" and "advanced practice nursing". As such, ANT offers a way to seek the means by which primary care organization are produced and what it is about NPs (themselves an effect of actor-networks) that mediates their articulation with these organizational processes and practices.

Unlike other frameworks, such as ecological or systems theory, which are decidedly static, ANT can capture the dynamic and ever changing quality of the network, understood as a moving target of hybrid relationships that make up the "health care collective". It is more responsive to complex and morphing patterns of associations and can therefore accommodate unstable and shifting frames of references.[36] ANT is relevant "whenever things accelerate; innovations proliferate; boundaries between groups are blurred; and the number of entities in the collective multiply".[35 p106]. Primary health care (PHC), interprofessional teams, health networks and role negotiation are just some of the many heterogeneous entities in a constant state of flux that may be better understood through the concept of translation. Actors include persons, such as nurses, patients, various health professionals and administrators, but also non-living beings, such as policies, standards of practice, computers, rumours, pathogens, media accounts, statistics, medications, and patient charts.

Interdisciplinary collaborations, local health networks, primary health care agencies, computer networks, policy networks, advocacy or consumer groups, teaching institutions, and research groups are just some of the networks that NPs can be enrolled in in the context of their professional practice. NPs can establish connections with a number of larger, distant networks, without losing their specificity as actors. A nurse practitioner is a network in and of herself, shaped and made to act by an elaborate arrangement of relationships and interests. In the context of health reforms that seek to employ more NPs, successful alignment of various entities such as position statements and research evidence, can create "hard facts" about NPs' purpose, competency, and contribution to health care, and through this alignment create a context favorable to their integration. Despite successful alignment, the nurse practitioner can be construed as a disturbance in the "PHC network" that disrupts existing relationships and creates new ones, while enrolling new actors in the process. Yet we contend that the NP can also be considered a stabilizing force inasmuch as she supports the attainment of particular "organizational" goals, such as improving access to health services and treatments, patient outcomes and cost effectiveness of services.[49,50]

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As such, much like electronic records, diagnostic imaging systems, patient databases, telehealth and mobile devices, all of which are touted to drive modern health care, advance practice nurses appear to be likened to a form of technology (in a broad sense) that can also transform the face of health care, by improving continuity of care, increasing access to services, reducing costs, streamlining certain services or programs, and optimizing existing resources (for example, by making it possible for physicians to focus on more complex cases). These notions however rest on a set of assumptions. For example, it assumes that NPs constitute an ontologically discrete group that can exist outside of technological devices, separate from health policies, and distinct from what are conceptualized as 'other' professional groups, and that can be 'inserted' unproblematically into equally clear-cut 'contexts' (e.g. primary health care) and organizational structures (e.g. integrated teams, PHC clinics).

In keeping with Latour's approach, investigating NP integration in PHC settings would involve the examination of the ways in which clinical settings and related actors and actants are assembled and configured. Such configurations may involve entities as diverse as office spaces, diagnostic equipment, and chronically ill patients, and they set boundaries in terms of what actions will be possible over the course of time[51], which in turn impacts the steadiness of associations and the network itself. Associations then shift, move, dissolve and re-form in ways that are not entirely anticipated. For example, while the literature reports that interprofessional collaboration and NP integration yield excellent patient outcomes, some of the entities involved do not necessarily act in the required way to achieve these results. Configuration of the setting serves to reduce the likelihood of this scenario. For such configuration to take place, 'preparatory work' may occur so that events and processes unfold in ways that are consistent with the network's purpose and function. In the context of NP integration, perhaps this involves notifications being made, bulletin boards being updated, newsletters being released, office space challenges being sorted out, narratives being uttered about the implementation of a new player in the clinical setting.. All these contribute to the configuration of those entities that will come into contact with NPs and will, in turn, configure NPs themselves. Analyzing the configuration of actors, at the heart of which are ongoing translation processes, becomes a key task of the investigator.

As actors themselves, NPs embody, and are subjected to, certain codes, discourses, meanings and concerns that also *make them* act in certain ways in the course of their practice and provide their actions with social significance.

For example, such codes and concerns are crystalized in part in provincial, regional and institutional protocols that govern the scope of practice and day-to-day activities of NPs (and, consequently, of other professionals). Such protocols mediate interprofessional interactions (e.g. team meetings, consultation processes, delegation schemes, etc.) but also a range of non-human entities, such as space organization and use of time. These protocols therefore establish certain conventions and requirements through and by which NPs integrate the PHC network. They outline specific 'organizational competencies' that support the purpose of the network and, as such, they serve as an extension of broader meanings and interests. They also work to remove, reduce or manage possible unpredictable events (which could further destabilize the network and jeopardize its existence), by standardizing and routinizing decisions and practices. While NPs can constitute a perturbation in the PHC network, they mobilize a range of entities (e.g. protocols) that can offset (partly at least) the ensuing disturbances. The reciprocity of NPs and protocols provides just one of many examples of the way human and non-human elements configure one another and set the parameters for each other's existence. For NPs to accept and abide by these conventions and regulations, they must perceive a high enough level of alignment between these and their own narratives about advanced nursing practice in PHC. The ongoing constitution of these narratives, from the time nurses undertake their graduate studies to the present day, mobilizes further actors and actants that are themselves part of other networks (e.g. universities, regulatory bodies, clinical placement settings, ministry of health, etc.), thereby connecting NPs to both local and distant/global entities and neutralizing any presumption of geographic/spatial figuration. As such, though it is highly counter-intuitive, NPs cannot be conceived of as pre-existing, essential actors who act on their own initiative; they should rather be conceptualized as entities that respond to various contingencies and that are therefore constantly being made and re-made.

Throughout this section, we have suggested some of the ways ANT may support the production of new accounts about NP practice and role implementation. It provides a robust basis for envisioning the ways in which NP integration rests on multifarious associations and networks and requires the involvement of numerous entities, both tangible and intangible, both human and non-human, both material and semiotic. These may include care delivery models, medical technologies, laws, media outlets, diagnoses, chronic illnesses, professional socialization processes, budgets, managers, research evidence, office desks and computers,

all of which shape, and are shaped by, nurse practitioners. Such an approach remains flexible when attempting to understand the success or failure of role integration, as particular associations, rather than specific persons, come under scrutiny.

Latour states that, in order to understand the formation and re-formation of associations that make up the "social world", one needs to follow the *controversies* – those brief moments when disruptions occur that allow a glimpse into the complex, and sometimes fragile, workings of the network. In PHC, such disruptions may take the form of an epidemic, the introduction of new clinical guidelines or medical technology, budget cuts, or a change in institutional policy or corporate objectives. We suggest that the introduction of NPs in a given setting may constitute such a disruption in the PHC network, a disruption that brings into light the actions of the actors as they work to re-stabilize the PHC network. As seen earlier, current literature suggests that NP role integration often generates tensions, confusion, frustration and conflict. Along with Latour, we believe that the examination of group formations, as it occurs when a nurse practitioner enters a new setting and seeks to establish new collaborations, can lead to a fresh understanding of APN role deployment that is not reduced to mere role confusion.

Conclusion

ANT has much to offer with regards to nursing research, because it takes into account the hybrid nature of the world and the performance of non-human entities that shape events and processes, and contribute to their "social" quality. It also considers the importance of technology in social matters and works to eliminate traditional ontological categories. Central to an analysis of health care issues using ANT is the exploration of the ways actor mobilization occurs and interests and purposes are reconfigured and provided with convergence. Understanding the way actors negotiate relationships with all kinds of entities in their environment (including policies and technological devices) is key in understanding the way subjective positions are formed, negotiated and mediated—a core issue in the context of nurse practitioner integration.

ANT is not meant to provide ready-made answers to the tricky issue of proper NP integration in health care structures. It does, however, allow for new understandings and insights to emerge. Policies and legislation that support NP practice are clearly insufficient to dispel what are commonly perceived as barriers to implementation, such as misunderstandings of NPs' roles in health care. ANT can be of use to critically examine the kinds of dynamics, discourses, subjectivities

and meanings that emerge from, and in turn shape NPs' interactions with other entities (semiotic, technological, human, etc.) along a multitude of network relationships that shape PHC NPs' professional trajectories.

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To Contact the Authors:
Annie Rioux-Dubois, PHC NP, PhD(cand)
University of Ottawa
School of Nursing
451 Smyth Road
Ottawa, Ontario
K1H 8M5
Canada
Email: ariou013@uottawa.ca

Amélie Perron, RN, PhD
Associate Professor
University of Ottawa
School of Nursing