

An Epistemological Framework for Indigenous Knowledge

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Resumen

Este trabajo presenta un marco epistemológico capaz de hacer frente a la oposición entre conocimiento indígena y conocimiento científico, una oposición generalizada en la antropología, especialmente en relación con el problema del desarrollo sostenible. En la primera parte del artículo, proporcionamos un marco contextualista que satisfaga dos restricciones: la neutralidad a priori respecto a formas, o tipos, de conocimiento, y (2) la explicitud de las condiciones con respecto a la posibilidad de transferencia de conocimiento. En la segunda parte, aplicamos el marco para el caso específico del conocimiento algonquino del norte. A través de tal marco, se investiga y hace explícito el estándar epistémico subyacente puesto en juego, mediante la identificación de las condiciones en que creencias particulares son calificadas como conocimiento en el contexto algonquino del norte.

PALABRAS CLAVE: Conocimiento indígena, conocimiento científico, contextualismo, Algonquiano, desarrollo sostenible.

Abstract

This paper presents an epistemological framework capable of addressing the opposition between indigenous knowledge and scientific knowledge, an opposition widespread in anthropology especially in relation to the problem of sustainable development. In the first part of the paper, we provide a contextualist framework that satisfies two constraints: a priori neutrality with respect to forms, or types, of knowledge, and (2) explicitness of the conditions with respect to the possibility of knowledge transfer. In the second part, we apply the framework to the specific case of Northern Algonquian knowledge. By means of the framework, we investigate and make explicit the underlying epistemic standard at play by identifying the conditions under which particular beliefs are qualified as knowledge in the Northern Algonquian context.

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In this paper, we develop an epistemological framework to address the opposition between indigenous knowledge (IK) and scientific knowledge (SK), from both an epistemological point of view and an anthropological point of view. Although, anthropologically speaking, the notion of IK appears at first glance to be well enough delineated, from an epistemological point of view, it still conceals an important definitional difficulty. In particular, if one wants to compare IK with SK, one needs a precise concept that can express IK and SK. The difficulty is to define knowledge in a way that is, a priori, neutral so that both IK and SK can be *equally* captured by the definition. In the first part of the paper, we provide a framework that satisfies this requisite. The epistemological framework put at work, which is *indexical contextualism* (Cohen, 1987; DeRose, 2009), enables us to center the analysis on the meaning components of knowledge (or the knowledge predicate, to be precise). In the second part, we apply the framework to the specific case of Northern Algonquian knowledge in order to exemplify the results given by the framework. We make explicit the underlying epistemic standard at play by identifying the conditions under which particular propositional attitudes are qualified as knowledge in the Northern Algonquian context. These results show, in general terms, that contextual immediate efficiency and holistic coherence constitute the two main components of the epistemic standard specific to Northern Algonquian knowledge (Ermine, 1995; Michell, 2005).

Epistemological Framework

Indigenous approaches

Over the last decades many practitioners in the humanities and the social sciences have voiced the necessity to further integrate cultural parameters into theoretical perspectives in order to provide a better understanding of their object. This is the case for anthropology, for psychology, and even for epistemology. The conceptual tension between a *mainstream* approach as opposed to an *indigenous* approach has translated into different debates among these disciplines. In the case of psychology, the development of indigenous psychologies is a response to this challenge. Wallner and Jandl write:

The indigenous psychologies approach is a result of the lack of importance of cultural issues in mainstream psychology that established the nature science paradigm as the dominant framework of psychological investigations. (2006: 65)

The taking into account of cultural parameters impinges considerably on the universality of general frameworks. Far from being superficial, these changes reach

the core of the theory, not only its goals but also its methodology (Hwang, 2005)¹. As Wallner and Jandl emphasize, the indigenous approach “underlies another understanding of the human being”. (2006: 70) The focus on cultural parameters is observable also in epistemology with the emergence of ethno-epistemology. Weinberg, Nichols, and Stich (2001) have shown some provocative results about the cultural contingency of epistemic intuitions, i.e., intuitions on what knowledge is.² The status of standard analytic epistemology remains since under pressure (Maffie, 2002; Bishop and Trout, 2005; Knobe and Nichols, 2008).

In anthropology this tension has taken the form, among others, of an opposition between *scientific knowledge* and *indigenous knowledge* and their possible integration in the broad context of sustainable development. The problem of the links between these two kinds of knowledge is a “central issue” according to Rist and Dahdouh-Guebas (2006). Whereas in psychology and in epistemology the indigenous approach is more of a disciplinary concern, in anthropology the very notion of indigenous knowledge offers a particular interest in that it encapsulates in a single object the specificity of the indigenous approach itself. Furthermore, the conditions according to which indigenous knowledge (IK) and scientific knowledge (SK) may be integrated are fundamentally related to practical concerns, notably regarding education and development.

Although, anthropologically speaking, this notion of indigenous knowledge appears at first glance to be well enough delineated, from an epistemological point of view, it still conceals an important definitional difficulty. In particular, if one wants to compare indigenous knowledge with scientific knowledge, one needs a precise concept that do justice to both IK and SK. The difficulty here is to define knowledge in a way that is, a priori, neutral so that both IK and SK can be *equally* captured by the definition. If knowledge is understood solely in terms of SK, then IK seems to be relegated to the realm of mere beliefs and the term ‘knowledge’ does not seem to mean exactly the same thing in IK than in SK. The definitional difficulty consists consequently in defining knowledge in such a way that the legitimacy of IK and the robustness of SK are preserved.

Conflicting views

Some explicit definitions in the literature tend to be rather vague and tend to exacerbate a pre-theoretical opposition between IK and SK. For instance, Sillitoe proposes the following definition:

¹ Hwang rightly notes also that “the transition from indigenous psychology to an Asian psychology, global psychology, universal psychology or a human psychology implies a significant shift in philosophical presumptions [...]” (2005: 7)

² Similar researches in other fields are quite eloquent in this respect. For instance, Haidt et al. (1993) have investigated the cultural contingency of moral judgments, and Nisbett et al. (2001) and Atran (1998; Atran and Medin, 2008) have provided evidence on the influence of cultural parameters respectively on sociocognitive systems and on scientific taxonomies.

Indigenous knowledge is any understanding rooted in local culture. It includes all knowledge held more or less collectively by a population that informs interpretation of things. It varies between regions. It comes from a range of sources, is a dynamic mix of past ‘tradition’ and present invention with a view to the future. (2006: 1)

Rist and Dahdouh-Guebas suggest:

Indigenous knowledge is holistic, functional and adaptive to changes in social and natural environment, and it has been transmitted for many thousands of generations. (2006: 471)

It is not clear at all how qualifications such as “rooted in local culture”, “informs interpretation of things”, “holistic, functional and adaptive to changes”, and “has been transmitted for many thousands of generations” may significantly contribute (even jointly) to characterize IK.

Those conceptions have engendered conflicting views on the relation between IK and SK. Mato, who argues in favor of the *division* thesis, writes:

From an epistemological perspective, those other modes of knowledge production [the ones based on indigenous world views] are radically different from scientific knowledge. That is the challenge that must be mindfully assumed if, accepting and appreciating that difference, we wish to develop fruitful forms of intercultural collaborations. (2011: 415)

According to him, SK is nothing else than Western *local* knowledge (2011: 410).³ At the other end of the spectrum, one finds the *continuum* thesis with defenders like Sillitoe:

This bipolar discrimination between indigenous and scientific knowledge is inadequate, if not misleading as to the relationship and distinction between the two. [...] We can conceive of these relations as comprising a continuum. At one end are locals with little formal education, whose knowledge is largely locally derived, and at the other end are trained scientists, contending with interdisciplinary research. (2006: 2-3)

Sillitoe prefers to think of IK and SK as “meridians on a globe, each representing a different domain of knowledge.” (2006: 4)

The lack of precision with respect to the notion of IK has allowed also for strong anthropological projects. For instance, Pioretti wants “to establish Indigenous approaches as equivalent to Western science in usefulness and insight, but different in approach” (2011: 8). According to him, the indigenous and the Western ‘worldviews’ both turn out to be ‘correct’ (2011: 9). Evidently, such a correctness cannot be

³ Mato holds actually a radical view on knowledge: “There is no ‘universal’ knowledge [...]. All knowledge is relative to the conditions in which it is produced.” (2011: 413).

understood univocally, otherwise only one of them would turn out to be correct. Is correctness, on the contrary, equivocal? If so, then anything is correct in some sense and one loses sight of the obvious and distinctive robustness of SK.

This perspective on the definitional challenge shows that there is a need for a precise and workable concept of knowledge that will place IK and SK on a par, as epistemic items, while giving the possibility of expressing their distinctive aspects. This is a precondition for approaching the IK-SK integration problem, for a biased concept would inevitably force, right from the start, the promotion of one type over the other. But, before undertaking the characterization of the required epistemological framework, we have to clarify two separate issues that are related to the integration problem.

Related problems

In order to address the main problem of IK-SK integration, one has to make a clear distinction between two other related problems. The first problem has to do with the (usually hidden) assumption that universality entails superiority (Mato, 2011; Wallner and Jandl, 2006), i.e., universal knowledge is superior knowledge. Such a hierarchy is made possible in virtue of an assumption that an ordering can be established among types of knowledge in terms of a measure of universality. This universality assumption acts as an a priori principle against which knowledge types are compared and ordered. But, it is an a priori bias with respect to the relation between types of knowledge, and the universality assumption appears only as one of many discriminatory properties for comparing knowledge types. One can select another epistemic property to compare types of knowledge, such as reliability, indefeasibility, and so on. We will refer to the choice of an ordering principle between different types of knowledge as the *K-hierarchy* problem.

The second problem one is facing when considering the IK-SK integration pertains to the explicitation of the conditions to satisfy for allowing the transfer from one type of knowledge to another type of knowledge, and in this particular instance, from IK to SK. This is the *K-transfer* problem. In the proposed framework, a K-transfer becomes possible when the satisfaction of the conditions of one type of knowledge implies the satisfaction of the conditions of another type of knowledge. In other words, to show K-transferability, one has to make explicit that the set of qualifying conditions of the first type of knowledge is included in the set of qualifying conditions of the second type of knowledge.

These two problems can be reframed in terms of the common notion of epistemic standard, i.e., the set of the qualifying conditions specific to a type of knowledge. In that view, K-hierarchy deals with the ordering of epistemic standards, whereas K-transfer is concerned with the inclusion of one epistemic standard into another. One requirement, though, for the treatment of both problems, is that the epistemic standards be comparable (or commensurable). If not, neither the K-hierarchy problem nor the K-transfer problem can have a solution. Consider an example. Let us say one has the choice between informed guessing and Bayesian inference for finding the cause of a certain disease. These two epistemic standards can be compared with

respect to some epistemic property such as truth-conduciveness (the propensity of an epistemic process to yield true propositions). And, even though from time to time informed guessing will give a good score, Bayesian inference will prove to be more truth-conducive over the long run. So, on the basis of truth-conduciveness an ordering can be established among the epistemic processes (or types of knowledge) and one appears more preferable than the other. But, ordering is not always possible, because some epistemic standards might just not be commensurable with respect to some epistemic properties. Consider, for instance, an epistemic standard that would require that the *source* of a propositional content, say p , be the testimony of an elder. According to such a standard, one would know that p if one has received a testimony *from* an elder with respect to p . How would one compare this standard of authoritative source with, say, truth-conduciveness? Think of p as some proposition part of a narrative about the origin of the world. How does one compare truth in a narrative with truth in an empirical description? The notion of truth is taken here equivocally, and the epistemic standard appears to be incommensurable in terms of truth-conduciveness. As a consequence, it cannot be a part of a hierarchy based on truth-conduciveness. Such a standard does not yield inferior knowledge, it rather yields incommensurable knowledge with respect to truth-conduciveness.

When epistemic standards are comparable, on the other hand, the possibility of K-transfer can be investigated. And this is where the notion of epistemic standard becomes crucial for the analysis of the IK-SK integration problem. Transferring knowledge from one type of knowledge to another is possible if the satisfaction of the first type epistemic standard implies the satisfaction of the second type epistemic standard, and the evaluation of this implication requires an explicit characterization of the two epistemic standards. For instance, consider two types of knowledge with different degrees of reliability, an empirical type and a perceptual type. Assume that each type is defined by a specific epistemic standard: empirical knowledge is the result of some empirical experimentation (it follows an empirical protocol, an empirical validation, and so on), and perceptual knowledge is the result of an immediate and actual visual perception (in normal circumstances, good lighting conditions, and so on). Now, imagine that an agent has empirical knowledge about refraction of light in water. This empirical knowledge places the agent in a position where her perceptual knowledge can be anticipated. The agent can know a priori that in the presence of a rod half submerged in water the rod will appear as bended. In this case, and under restricted conditions, empirical knowledge (stronger standard) would be transferable to perceptual knowledge (weaker standard). In this example, it is clear that the evaluation of K-transferability depends directly on the explicitness of the conditions defined by the epistemic standards. Analogously, if one wants to answer the question about the transferability of IK to SK, one has first to *characterize the epistemic standards* at play in order to make explicit the conditions under which epistemic qualification can be realized and under which a K-transfer would be possible.

Now, considering our main problem, the IK-SK integration problem, in relation to K-hierarchy and K-transfer, it is our claim that the IK-SK integration problem does not require a prior solution to the general problem of K-hierarchy. The IK-SK integration can be satisfactorily tackled by the angle provided by the more specific

problem of the K-transfer.⁴ But, in order to achieve such a task, the epistemological framework put at work must be such that it allows the expression of any kind of epistemic standard, even incomparable standards, without imposing any prior form of hierarchy, since the conditions of hierarchy are given by the conditions of transferability. This constraint translates in the need for an abstract epistemological framework, capable of representing a variety of types of knowledge (or concepts of knowledge) as well as possible hierarchies among them. In the following section, we present a contextualist framework that meets this constraint.

Indexical contextualism

Traditionally, knowledge has been understood as a qualified representation. In Aristotelian terms, for example, knowledge is an instance of an *adequate* representation of a state of affairs. Adequacy here means that there is some sort of conformity between the mental representation and what is represented. This representational framework has been generally left aside for quite a century now. It is widely accepted that the properties of a mental representation are objects for cognitive psychology and cognitive sciences in general, and that epistemology has to be informed by these disciplines. The working framework nowadays is propositional and knowledge is rather conceived as a *propositional attitude*. In that perspective, when one knows something, one has a particular attitude (an epistemic one) towards the truth of a propositional content. This is the view in which our proposal will take place.

The epistemological framework that we want to suggest is based on the idea that the knowledge predicate (K-predicate), i.e., *x knows that p*,⁵ behaves like an indexical term in a natural language. An indexical is a term whose meaning comprises two components: an invariable component, its *character*, and a variable component, its *content*, which varies contextually.⁶ In order to understand the full meaning of an indexical, one has to grasp both the character and the content. For instance, indexicals such as *here* and *now* have for characters respectively the meaning of a *spatial pointer* and the meaning of a *temporal pointer*. It is their respective content that specifies the particular point in space and particular point in time to which the indexicals refer. In this particular context of utterance, *here* would be a spatial pointer (character) referring to Sherbrooke (content) and *now* would be a temporal pointer (character) referring to 10:30 a.m. (content).

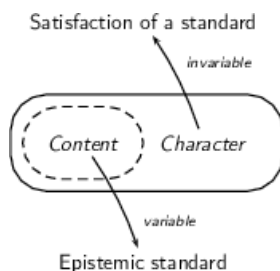
In conceiving the K-predicate as an indexical term, one has to partition off its meaning into a character and a content. The references of the invariable and the variable parts of the meaning have to be explicitly defined. In the case of the variable part, which is contextually fixed, it refers to what is epistemologically relevant and

⁴ It is worth noting that if a K-transfer is possible, then a K-hierarchy is also possible, since a set inclusion relation (inclusion of epistemic conditions) is an ordering relation.

⁵ In the formulation of the predicate *x knows that p*, *x* refers to an epistemic agent and *p* refers to a propositional content.

⁶ This important distinction is due to David Kaplan (1989).

changing from one context to another, namely the *epistemic standard* in use. As regards the invariable part, which is the constant meaning of the K-predicate in each and every knowledge ascriptions, we will follow the suggestion of Williams (2001) and define the character of the K-predicate as a *success* term. A success term, like the verb *to win*, means that some condition or rule has been satisfied. This falls well into place with the idea that the content of the K-predicate is an epistemic standard (something that can be satisfied):



Indexical interpretation of the K-predicate

In final analysis, according to the indexical interpretation of the K-predicate, *x knows that p* will mean that *x* has satisfied some epistemic standard with respect to the truth of some proposition *p*.

The indexical interpretation of the K-predicate sheds new light on the IK-SK integration problem. It is now possible to consider IK as well as SK in terms of epistemic items of the same generic type, i.e., they are both instances of knowledge *simpliciter*. They both share the same invariant meaning in their character, while having a distinctive meaning in virtue of their content (their respective epistemic standard). What one calls IK is not a degenerated form of knowledge or, even worst, the result of some linguistic mistake or misuse of the term *knowledge*. IK and SK have the same *prima facie* status as epistemic items (neutrality w/r to K-hierarchy) in the sense that both are the result of the satisfaction of their respective epistemic standard. Despite the differences in the epistemic standards, having knowledge means in all cases having satisfied a given standard. This framework has a direct consequence upon the IK-SK integration problem to the extent that the analysis will involve two epistemic entities (two epistemic standards) and not only one, and without presuming that one has to be eliminated so that the other could remain the sole paradigm. Another consequence of this framework is the change in focus. The integration problem becomes a problem about epistemic qualification processes. It focuses on the *relation* between epistemic standards and their respective epistemic by-products.

This epistemological framework, which is properly *indexical contextualism*,⁷ is susceptible to contribute to the interdisciplinary task of characterizing IK in enabling

⁷ This view has been initially developed by Cohen (1987). Another important proponent of epistemological contextualism is DeRose (2009).

us to center the analysis on what is really relevant, to wit the conditions under which an agent is said to know something. One of the main advantages of this framework lies in its respectful approach to the variety of sorts of knowledge that our daily epistemic practices and transactions clearly exhibit (ordinary knowledge, knowledge of the past, knowledge of the future, and so on.) It also forces the epistemological analysis, in its very first step, to be empirically informed by observations and descriptions of the target epistemic practices, as the following section will show.

Case Study: Northern Algonquian Knowledge

In this section, we provide an application of our contextualist framework to the specific case of Northern Algonquian knowledge in order to illustrate some characterization of IK in terms of epistemic standards. This constitutes only the first part of an answer to the question of IK-SK integration. It serves as test case for the process of characterizing an epistemic standard specific to a particular form of indigenous knowledge in the perspective of the proposed epistemological framework.

Northern Algonquians are part of the larger Algonquian linguistic family which includes dozens of Native nations ranging from Western, Central and Eastern Canada up to the Grand Lakes and Northeast Coast regions of the United States. The Northern subdivision of the Algonquian family includes nations such as the Crees, Ojibwas and Innus whose traditional territorial basis coincide with the Subarctic Shield surrounding Hudson's Bay. Before the 1950's, most of the Northern Algonquians were small nomadic populations living from hunting, fishing and gathering. Following the arrival of Europeans, fur trade became an integral part of their way of life. During the long winter season, hunting groups composed of a few families scattered all over the territory in the pursuit of big games and furbearers, while during the summer months larger social units gathered at traditional sites. In the second half of the 20th century, a more sedentary life was adopted; although the villages and reserves became the principal loci of occupation, many Algonquian hunters and families continued up until now to spend time in the woods and practice traditional hunting activities.

While a significant number of studies on Northern Algonquian traditional knowledge have been published over the past twenty-five years, a large majority of them have focused on the descriptive aspect of it through an ethnographic approach, or its relation to scientific knowledge in terms of differences, similarities or integration potential. Rarely efforts have been made to render explicit the underlying epistemic standards of Northern Algonquian knowledge and identify the conditions under which specific propositional attitudes are qualified as knowledge. A preliminary review of the literature leads us to tentatively identify one such fundamental epistemic standard among Northern Algonquian populations characterized by 1) the contextual and immediate efficiency of a propositional belief and 2) the coherent and profitable inscription of such a propositional belief into a holistic worldview and representation of the components of the surrounding universe and their interactions.

Contextual and immediate efficiency

Two categories of knowledge are usually recognized among indigenous populations. One is qualified as traditional knowledge or secondary knowledge. Inter-generational and passed on by the communities elders, it represents a “cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission” (Berkes, 2008: 7). The other can be qualified as primary knowledge, that is the body of knowledge, practices and beliefs that an individual acquires through his or her personal experiences (Rushforth, 1992: 484-485). For example, O’Flaherty reminded that elders in the Ojibwa community of Pikangikum (Ontario) make a distinction “between those who have land-based knowledge (Ahkeeweekeekaytuhmuhweeneeng) rooted in personal experience and the authoritative knowledge held by esteemed elders (Keecheeahneesheenaubay Weeekaytuhmuhween); anyone can have knowledge about the land, but only respected elders are considered to hold the specialized knowledge associated with the stewardship responsibilities of a senior keeper of the land” (O’Flaherty, 2008: 9-10). Such experiences can be related to subsistence activities, social interactions or result from dreams, visions or even intuitions. Thus Northern Algonquian (primary) knowledge, like any other system of knowledge, carries an observational component, a practice component and a belief component (Berkes et al., 2000: 1252). But while Rushforth stated that such knowledge is based on “primary epistemic evidence” (Rushforth, 1992: 484-485) he missed to define such a concept from an indigenous perspective, leaving to the imagination what are these epistemic evidences or standards at the basis of primary Northern Algonquian knowledge, for instance.

One epistemic standard which seems to transcend the different studies on Northern Algonquian knowledge is its contextual bounding. In an Algonquian perspective, knowledge of the environment, exploitative strategies, technology, social relations and spiritual beliefs are vital to insure subsistence and survival. Thus, knowledge is primarily linked to observation of the surrounding natural, social and supernatural environments and direct experiences with them. And as primary knowledge is concerned, it is not something that an individual is working to acquire, but something that is given to him through his or her immediate personal experiences and interactions with these environments. For example, Michell informed that “Woodlands Cree knowledge is manifested in different forms, some of which is practical and learned through day-to-day activities that revolve around survival. Our people also possess empirical knowledge that is learned from careful observations of the natural world over extended periods of time” (Michell, 2005: 36), so that Northern Algonquian epistemology can be qualified as “participatory, experiential, process-oriented, and ultimately spiritual” (Michell, 2005: 36). From this, one can suggest that Northern Algonquian epistemology requires for a propositional belief to be considered knowledge that its relevance and efficiency be immediately proven in regard to everyday life necessities and challenges, whether they are of an economic, social or spiritual nature. And the individual experiencing a given situation must be considered the sole authority on the validity of a given propositional belief. As Peloquin and Berkes mentioned, “Cree hunters [...] usually avoid judging someone

else's perception and knowledge, and favor speaking from direct experience. When participants speak of a phenomenon, they usually refer to a specific event that they have themselves observed" (Peloquin and Berkes, 2009: 536).

However, as daily realities show variability, so does knowledge. This is not to say that new knowledge has to be produced every time the natural, social or spiritual environment changes or presents new challenges, but that existing knowledge has to be adapted to current circumstances (Berkes and Turner, 2006: 483-484), or simply ignored or abandoned if no longer relevant. Citing Ingold, Peloquin and Berkes report that:

[...] for the Ojibway [...] knowledge does not lie in the accumulation of mental content. It is not by representing it in the mind that they get to know the world, but rather by moving around in their environment, whether in dreams or waking life, by watching, listening and feeling, actively seeking out the signs by which it is revealed [...] hunters communicate, exchange observations, and as appropriate, attempt to change their practices and behavior according to their interpretations of ongoing changes and develop adaptation strategies. This amounts to a flexible monitoring of change that relies on opportunistic observations of unusual events and occurrences. The Cree ways of knowing, in this context, appear to be largely (but not exclusively) qualitative and probabilistic. They note unusual events but do not seek to measure trends or observations of change as scientists might. Their understanding does not require proving causal links or cause-effect relationships « (Peloquin and Berkes, 2009: 543-544; Preston, 2002).

So Northern Algonquian primary knowledge is based on practical common sense which is constantly reconfigured in regard to current conditions, and what constitutes its epistemic standard is the effectiveness of a given propositional belief regarding the immediate contextual needs.

The holistic coherence

A second characteristic of the proposed epistemic standard that may be identified from the current literature on Northern Algonquian knowledge refers to the necessity for a proposition to be coherent regarding the holistic-oriented interactions among all components of the material and spiritual worlds (Ermine, 1995). All these components are seen as interdependent, and a propositional belief may be considered adequate knowledge only if it can be translated in thoughts or actions that don't jeopardize or break in any way the vital balance of the universe. As McGregor stated, aboriginal understandings do more than "focus on relationships between knowledge, people, and all of Creation [...] it] is viewed as the process (a verb) of participating fully and responsibly in such relationships, rather than specifically the knowledge gained from such experiences" (McGregor, 2009: 75). Thus, each individual has an obligation to use his or her knowledge in such a way as to insure the holistic coherence of the world. And like other indigenous systems of knowledge, Northern Algonquian knowledge is embedded first in a community's specific culture and value

system, “grounded in a people, a place and a history” (Sefa Dei, 2000: 114-115). So, adequate knowledge has to be evaluated and exercised in respect to some local normative behaviors thought to be essential to the equilibrium within community members’ interactions, such as humility, respect, sharing and reciprocity (Berkes et al., 2000: 1259). These normative behaviors also determine the relations with the natural environment of which the community is an integral part. For example, Berkes et al. remind that “Cree and related groups in the Eastern and Central Subarctic use a word, *ashkii* in the case of the Eastern James Bay Cree, and *aski* in the case of the Anishnabe/Ojibwa, which is more properly translated as ecosystem rather than land because it refers to plants, animals, and humans, as well as the physical environment. The Western James Bay Cree consider that “the Indians go with the land” as part of “land’s dressing” in the sense that the presence of humans makes the land complete” (Berkes et al., 1998: 410; Michell, 2005: 38). And citing Michell, Aikenhead reminds us that among the Plains Cree nation, the phrase “coming to know” means that a person “is on a quest to become wiser in living properly in their community and in nature. To live properly includes the goal of living in harmony with nature for the sake of the community’s survival” (Aikenhead and Ogawa, 2007: 553).

So, to be considered valid in the Northern Algonquian system of knowledge, a propositional belief must be easy to integrate—in a contributive way—within the holistic dynamics of the environment, thus showing compatibility with a large number of variables related to the physical, intellectual, emotional and spiritual aspects of the world. In consequence, the validity/efficiency of a propositional belief will have to be proven through multiple dimensions. For example, knowledge of the spirit of the “bear master” among the Eastern Cree could be appreciated on different levels, as Scott explains:

[...] in some contexts we might refer to the ‘bear master’ as a spirit [...] but the category also acts as a scientific concept—or perhaps more exactly, embodies postulates—in his sense. The bear master is an abstract expression of verifiable propositions about ecological reality. To respect the bear, hunters say, is to maintain the flow of animal gifts to hunters. When hunters respect animals in certain practical ways, such as strategic self-restraint in hunting, an ecological scientist might conclude that the sustainability of animal ‘gifts’ is verifiably enhanced [...] sacred and purposive knowledge are complementary [...]. Sacred and rational-empirical aspects of knowledge intensify and reinforce hunters’ attention to the world, and mutually inform their understanding of it. (Scott, 2006: 52, 65)

So, as Michell mentioned, there is a multidimensional equilibrium to preserve by “maintaining adequate respectful interconnected, reciprocal and sustainable relationships beginning at the individual level embracing family, community, nation, and extending out toward the environment, plants, animals, and cosmos” (Michell, 2005: 40), and he goes on to describe how the Woodlands Cree demonstrate their relationships with plants and animals through protocols and ceremonies. These protocols and ceremonies, like other thoughts and practices, are based on propositional beliefs qualified as knowledge because it meets its immediate purpose in a given

context, and this from different perspectives in accord with the holistic representation of the world. This is why Northern Algonquian knowledge may be qualified as holistic in outlook and adaptive by nature (Berkes et al., 2000: 1252); knowledge is derived from direct engagement with the elements, and great attention is given to the nature of the relationship between processes (Sefa Dei, 2000: 114-115).

Conclusion

The epistemological framework provided by indexical contextualism handles satisfactorily the two related problems to IK-SK integration. Regarding the K-hierarchy problem, the contextualist framework neutralizes any a priori hierarchy, which, in turn, allows for an egalitarian expressibility of the various forms of knowledge. With respect to the K-transfer problem, the contextualist framework makes explicit the conditional structure (in terms of epistemic standard satisfaction) for the transferring of knowledge. Another quality of the framework lies in the obvious necessity of a prior description and characterization of the epistemic standards involved. This is where the anthropological investigation becomes crucial. The characterization of IK can only be extracted from field data, i.e., epistemic practices, testimonies, and so on. Our case study has shown one example of such characterization. The epistemic standard at play in Northern Algonquian knowledge involves immediate efficiency and holistic coherence.

This framework opens up a perspective in which several epistemic standards, defining different types of knowledge, may be compared and evaluated on the basis of the satisfaction conditions specific to the K-predicates at play in their respective epistemic practices. On this view, when facing the integration problem, one does not ask whether a particular knowledge system, as a whole, is transferable into another knowledge system. One rather investigates the particular relation between some particular epistemic standards. These epistemic standards are the only potential links between IK and other types of knowledge.

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