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Posted Date: 12 September 2023

doi: 10.20944/preprints202309.0731.v1

Keywords: Heuristic Model, System, Complexity, Method, Intercultural Communication Studies, Gregory Bateson, Anthropology, Informational Realism, Quebec.

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Systems Theory and Intercultural Communication: Methods for Heuristic Model Design

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Abstract: This article focuses on methods for designing heuristic models within the paradigm of systems theory and in the disciplinary context of intercultural communication. The main question arises from the striking observation that the common language is insufficient to develop knowledge about human communication, especially when many factors of complexity (such as ambiguity, paradoxes, or uncertainty) are involved in the composition of an abstract research object. This epistemological, theoretical, and methodological problematic is one of the main challenges to the scientificity of anthropological theories and concepts on culture. Moreover, these questions lie at the heart of research in intercultural communication. Authors and theorists in the complexity sciences have already stressed the need, in such case, to think in terms of models or semiotic representations, since these tools of thought can mediate much more effectively than unformalized language between the heterogeneous set of perceptions arising from the field of experience, on the one hand, and the philosophical principles that organize speculative thought, on the other. This sets the scene for a reflection on the need to master the theory of heuristic models when it comes to developing scientific knowledge in the field of intercultural communication. In this essay, my first aim is to make explicit the conditions likely to ensure the heuristic value of a model, while my second aim is to clarify the operational function and required level of abstraction of certain terms such as *concepts*, *categories*, *headings*, *models*, *systems*, or *theories* that are among the most commonly used by academics in their descriptive accounts or explanatory hypotheses. To achieve this second objective, I propose to create cognitive meta-categories to identify the three (nominal, cardinal or ordinal) roles of words in the reference grids we use to classify our ideas, and to specify how to use these meta-categories in the construction of our heuristic models. Alongside the theoretical presentation, examples of application are provided, almost all of which are drawn from my own research into the increased cultural vigilance of the majority population in Quebec since the reasonable accommodation crisis in this French-speaking province of Canada. The typology I propose will perhaps help to avoid the confusions regularly committed by authors who attribute only cosmetic functions to words that nevertheless have a highly heuristic value, and who forget to consider the logical leaps of their theoretical thinking in the construction of heuristic models.

Keywords: heuristic model; system; complexity; method; intercultural communication studies; gregory bateson; anthropology; informational realism; Quebec

INTRODUCTION[1]

The inadequacy of language for understanding human communication

One of the main problems of cultural anthropology is to describe cultures *in words*, a difficulty that is almost impossible to avoid due to the unquestionable privilege accorded to linguistic modes of representation in humanities and communications research. I became aware of this problematic aspect of the discipline when I studied ethnomusicology several years ago. I had noted on the first page of my notebook Charles Seeger's recommendation, quoted here by Bruno Nettl, that scholars should be "constantly on guard against unknown and imponderable factors introduced into their

[1] I would like to thank Bob W. White and Maude Arsenault for proofreading the final version of this text, and for their appreciated comments and suggestions.

works as a result of dealing with one form of communication in the mode of another, that is, talking about music" (Nettl, 1983: 23).

Long before Seeger became concerned with this epistemological and methodological difficulty (1970s) and thereby highlighted the problem of "horizontal" transposition or translation in cultural research (from one mode or one code of communication to another)[2], researchers of the previous generation (1950s) were also concerned with the role played by theoretical language of academics in proceeding to "convert indigenous categories into scientific concepts [i.e.] into intellectual tools with a heuristic vocation and transcultural scope" (Obadia 2012: 36-37). In the course of this "vertical" process (from one level of communication to another), the Māori notion of *tapu*, for example, became a concept referring to moral prohibitions after a conversion requiring its "deculturation" in order to "confer on it descriptive and heuristic faculties that can be transposed to other contexts". According to Obadia, the debate is, in this case, "examining the relationship between the emic (indigenous) and etic (scientific) categories" of culture (Obadia 2012: 37).

By taking an even broader view of this central problem of metacommunication in cultural behavior studies, anthropologist Gregory Bateson sent out a much more serious and concise warning when he asserted that "words are dangerous things" threatening the scientificity of our theoretical endeavors (Bateson, 1972, p. 80). His most acerbic comment on this topic was aimed at the "commonly used" behavioral science terminology of his day, such as:

> "ego," "anxiety," "instinct," "purpose," "mind," "self," "fixed action pattern," "intelligence," "stupidity," "maturity," and the like […] For the sake of politeness, I call these "heuristic" concepts; but, in truth, most of them are so loosely derived and so mutually irrelevant that they mix together to make a sort of conceptual fog which does much to delay the progress of science. (Bateson 1972: xviii).

Clearly, Bateson had in mind a much more fundamental aspect of the problem of developing knowledge through language, one whose consequences go far beyond the difficulties of changing code (*translation*), mode (*transposition*) or perspective (*interpretation*). Although Bateson did not underestimate the importance of the latter - he said, for example, that "to try to construct a machine to translate the art of one culture into the art of another would be [...] silly" (Bateson 1972: 136) - he was nevertheless more concerned with the fundamental cognitive problem of *representation*, in general and specific scientific contexts, as also discussed by Immanuel Kant before him in terms of "understanding", "reason" and "judgments" (both synthetic and analytic) in his *Critique of Pure Reason* (1781).

It would take several pages, even several articles, to demonstrate the profound link between Bateson's epistemological and methodological thinking in his domain of "culture contact" studies, on the one hand, and Kant's "general method of imagination", on the other[3]. While using a different vocabulary, Bateson nevertheless remained very close to Kant's ideas on "methods of representation", particularly on the "schematism of the pure concepts of understanding", the introduction of intuition into the development of knowledge, the *intermediate* place occupied by the heuristic procedures of research - i.e. between "principles" and "experimentation", in Kant's terms, or between the "foundations of science" and the "data of experience", in Bateson's[4] - and above all, on *Architectonics*

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[2] This aspect of the question was discussed at length by members of the research team surrounding anthropologist Gregory Bateson in Palo Alto, in the 1950s.

[3] There is also a strong link between Bateson's *Ecology of Mind* (1972), the "doctrine of categories" or "anatomy of human understanding" described by Johann Heinrich Lambert in the *New Organon* (1764) and *The Architectonic* (1771) (Fichant 2018), Wiener's *Cybernetics* (1948), and other General System theories.

[4] It is hard to deny the kinship of spirit between these two remarks, one by Bateson - « in scientific research you start from two beginnings, each of which has its own kind of authority: the observations cannot be denied, and the fundamentals must be fitted. You must achieve a sort of pincers maneuver » (Bateson 1972: xx-xxi) – and the other one by Kant – "Reason, holding in one hand its principles […] and in the other hand the experiment

which in Kant's philosophical terminology, is none other than "the art of constructing systems" (Godin 2004: 100)[5]. Kant's and Bateson's respective pleas for what we should now call *General systems theory*, and its *Methods of heuristic model design*, are not only eloquent, but also logical and convincing. To go straight to their common conclusion, we could say that all knowledge of the phenomenological environment depends on our capacity of designing *heuristic models*, which are "mediating representations" or, even more simply, a kind of "third thing" that goes between *pure concepts of understanding* and *empirical intuitions*.

Insofar as we consider that any *model* can be this "third thing", the notion becomes therefore crucial in scientific thinking. For this reason, we should resist the temptation to confuse the abstract idea of "model" with any other that might be easier to grasp, but at the same time dangerously misleading. If, however, we still wanted to form an image from a comparison, we would have to imagine a template rather than a mold, as I underlined in a previous publication (2022: 53)[6]. But it is best to refer to the definitions proposed by recognized theorists like Kant, Bateson, Weil, Le Moigne, Morin, Estivals and others.

In a chapter entitled "On the schematism of pure concepts of the understanding" (1781) Kant gave his philosophical definition of what is a *model*, which he called a *transcendental schema*:

> Now it is quite clear that there must be some third thing, which on the one side is homogeneous with the category, and with the phenomenon on the other, and so makes the application of the former to the latter possible. This mediating representation must be pure (without any empirical content), and yet must on the one side be intellectual, on the other sensuous. Such a representation is the transcendental schema. (Kant 1781).

In *Mind and Nature: A Necessary Unity* (1979), Bateson also gave his definition of what is a *model*, which he called a *pattern which connects*. The purpose of this "metastructure" is to preserve the organizational coherence and functional maintenance of the ecological units under study, which risks being dismembered by analysis processes:

[…] must approach nature in order to be taught by it. It must not, however, do so in the character of a pupil who listens to everything that the teacher chooses to say, but of an appointed judge who compels the witnesses to answer questions which he has himself formulated" (1929/1781: 20).

[5] If we were to subsume the many names for the systemic method under a single term, we would be well advised to choose the Greek word ***arkhè***, from which derive the word ***architectonic***, but also the word ***architecture*** (whose art is supported by "a principle of order of the unity of form" (Duddy 2018), the word ***archangel*** (which evokes the superior, artificial and disembodied form of the general system) and the word ***archetype*** (in the Platonic sense of idea). It may further be pointed out that the Greek verb ***arkhein***, meaning to command or direct, creates an interesting semiotic link with the word cybernetics, which Norbert Wiener defined as "the study of control and communication in machines and living beings" (Wiener 1963: vii). (Duddy 2018).

[6] Whereas a template is an indicator of proportions, a mold imposes scales of size and is, in short, nothing more than a hollowed-out, fixed, and predetermined object. This distinction is crucial to the proper use of the concept of heuristic model in the paradigm of the general system theory. The way in which French philosopher Simone Weil (1909-1943) clarified this conceptual shift - from "molded forms" to the "template of proportional relations" - is eloquent. She writes that a reform of thought should "always appear either as [...] an adaptation whose object is not a change but, on the contrary, the maintenance of an invariant ratio, as if one has the ratio 12 to 4 and 4 becomes 5, the true conservative is not he who wants 12 to 5, but he who from 12 makes 15" (Weil 1988 [1947]: 172). In other words, the conservation of forms (through the use of a mold) can lead to the mutation of relations, while the conservation of relations (through the use of a template) can lead to the mutation of forms.

> My central thesis can now be approached in words: The pattern which connects is a metapattern. It is a pattern of patterns. It is that metapattern which defines the vast generalization that, indeed, it is patterns which connect (Bateson 1979: 11).

If the modeling method seems clear to Kant, Bateson, and others (Simone Weil, Norbert Wiener, Nicolas Luhmann, Robert Estivals and Edgar Morin, among them), the multiplication of formulations used to describe it is nonetheless perplexing, and this does a great disservice to the comprehension of heuristic models' theory. As a contemporary example of the conceptual "fog" that results from deficient formalism in scientific discourse, I could cite the one Lionel Obadia helps to thicken in a chapter devoted to "Questions of method" raised by *Anthropologie des religions* (2012). Considering that his research object (beliefs) is highly abstract and always complex, and therefore requires the support of words, Obadia asserts that the singular religions studied by anthropologists "have given rise to the formulation of major *models*" that come "under six *headings*" to which other "*categories*" are sometimes added, even if these are less central "than the aforementioned *concepts*". The diversity of these "*models*" reflects different "*systems*" that are either "*studied*" or "*theoretically created*" by ethnologists (Obadia 2012: 43)[7]. If Obadia's text seems literary enriched by the procession of synonyms he uses, it seems to me that the whole is rather confusing, especially for those who defend the posture of systemic modeling theories. From this point of view, we must unfortunately note that the terms Obadia equates – *models, headings, categories, concepts, and systems*, all these words aiming to subsume the variable forms of religion[8] - are not substitutable with one another, that they are not at the same level of abstraction, and that they should not even appear other than in a certain order corresponding to the modalities (inductive or deductive) of the reasoning supported in the thesis being put forward. In confusing these terms - in particular, by making a model the equivalent of a system - Obadia commits a logical error which suggests that his words are formulated with an artistic rather than scientific concern[9].

Model and *system* are two different things. A *model* "is a theorization of reality or a preparation for action on reality [whereas] the *system* is a general theory" (Estivals 2002: 104). In other words, "a model is such because of its direct relation to reality. A system is such because of its general theorization of models" (Estivals 2002: 118). For Estivals, whose perspective was that of the information sciences, the construction of a model (modelization) and the construction of a system (systemization) are two distinct and orderly stages in the process of theoretical abstraction, either inductively or deductively[10]. While modelization consists in building "a conceptual whole directly

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[7] In the last part of this quote, Obadia balances between two possibilities: that a system can be "studied" - and therefore observable in reality - or that it is rather "theoretically created by ethnologists" - and therefore integrated in its spirit. An answer is provided in Le Moigne (2006) and reasserted in White and Genest (2020): in complexity sciences, a system is a formal framework for thought, not an institution rooted in reality.

[8] This would mean that Obadia considers "primitive religion", "animism", "magic", "witchcraft", "totemism", "shamanism", "fetishism", "paganism", or "polytheism" to be simultaneously *models, headings, categories, concepts, and systems* (Obadia 2012: 43).

[9] From my dual point of view as a professional creator (in the field of music) and qualified anthropologist (in the field of culture), I consider that it was Bateson who best understood and explained the essential epistemological difference between art and humanities. Although both are equally "concerned with the relation *between* levels of mental process", researchers err when they interweave those levels, while creators err when they dislocate them (Bateson 1972: 464).

[10] When proceeding by induction (i.e., from the level of perceived experience to that of cognitive schematization to the effort of systematization), the model must be conceived as an "autonomous, compact conceptual object that substitutes itself for a concrete phenomenon in order to better define certain properties" (Walliser 2011: 7). Seen in this way, the main purpose of a model is "to compensate for the limited rationality

derived from a limited category of phenomena, and linked to them by analogy", systematization "involves comparing models that have already been established and verified, to derive a general explanation valid for a much wider field of study" (Estivals 2002: 118).

In systems thinking, then, the whole explanation process - which originates in lived experience - is "based on two stages, the second of which is the construction of *systems* through systematization, i.e., the comparison of models" (Estivals 2002: 118). In terms of organizing ideas, heuristic models are cognitive tools conceived to bridge the intellectual gap between what he perceives as a complex reality to be studied, on the one hand, and the abstract architectonics of *General Systems Theory*, on the other. Several authors have made "general systems theory" explicit, notably Jean-Louis Le Moigne (2006). For this reason, I will not go into it here. Instead, I will focus on heuristic models, as they make up the first half of the whole explanation process.

The need for model-based thinking

Before embarking on the long process of representing reality by building a heuristic model, any researcher may be inclined to ask whether this modeling phase is really necessary. The answer is quite simple: the more *abstract* and *complex* the object of research, the more urgent and inevitable the need to build heuristic models to reflect on it becomes. There is no doubt in my mind that the anthropology of intercultural communication has to deal with an object that is both abstract and complex. But it is not enough to say so: it has to be argued.

Firstly, *abstraction*. From a disciplinary point of view, the task of an anthropologist of intercultural communication is to observe "relation of difference" which is an element of reality that cannot be considered as *fact*, i.e., that it has no "real existence" or "real occurrence". Indeed, the very nature of data in the inquiry of intercultural anthropology is conceived as *information about relations* and as such can never be presented "as having objective reality". Bateson insisted on this point, modifying an idea of Kant, and drawing on advances in cybernetics, theories of perception (Gestalt) and other sciences of his time:

> Kant argued long ago that this piece of chalk contains a million potential facts (Tatsachen) but that only a very few of these become truly facts by affecting the behavior of entities capable of responding to facts. For Kant's Tatsachen, I would substitute differences and point out that the 'number of potential differences in this chalk is infinite but that very few of them become effective differences (i.e., items of information) in the mental process of any larger entity (Bateson 1979: 99).

This conception of human communication as a continual tracking of "differences that make a difference" (which means *information*) takes shape in the contemporary hypothesis of reality as a *world of informational objects* which includes mind, ideas, difference, change, information, command, and communication:

> Informational Realism argues that, as far as we can tell, the ultimate nature of reality is informational, that is, it makes sense to adopt a Level of Abstraction at which our mind-independent reality is constituted by relata that are neither substantial nor material (they might well be, but we have no reasons to suppose them to be so) but informational. (Floridi 2004)

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of the modeler, who is unable to apprehend the real system in all its complexity. It filters perceived reality, retaining only those aspects most relevant to a given problem. It offers a summary of knowledge concerning a fragment of reality, expressing it in a condensed, fixed form" (Walliser 2011: 7). When proceeding by deduction (i.e., from the highest level of abstraction to that of perceived experience), the model must then be conceived as an "application of the system to reality" with the aim of deriving knowledge or predictions (Estivals 2002: 104-105).

Considering what has just been stated, there is no doubt that the object of the anthropology of intercultural communication is highly abstract, essentially informational, and requires the support of a heuristic model in order to develop valid and scientific knowledge.

Then, *complexity*. Uncertainty, like ambiguity, hazard and other factors of complexity make the cultural behaviors studied by anthropologists a domain of human experience that may "never become knowledge" if we cannot grasp "the synthetic unity of phenomena", that is, if we cannot synthesize our cultural experiences "according to conceptions of the object of phenomena in general" (Kant 1781). Without such a capacity for synthesis, Kant asserts, experience "would be merely a rhapsody of perceptions, never fitting together into any connected text, according to rules of a thoroughly united (possible) consciousness, and therefore never subjected to the transcendental and necessary unity of apperception»:

> Experience has therefore for a foundation, a priori principles of its form, that is to say, general rules of unity in the synthesis of phenomena, the objective reality of which rules, as necessary conditions—even of the possibility of experience—can always be shown in experience. But apart from this relation, a priori synthetical propositions are absolutely impossible, because they have no third term, that is, no pure object, in which the synthetical unity can exhibit the objective reality of its conceptions" (Kant 1781, Translator: J. M. D. Meiklejohn, 2003).

As an abstract object of research, intercultural communication is clearly characterized by complexity. Such a complexity can take many forms, such as "fuzziness and imprecision, hazard and instability, ambiguity, uncertainty and unpredictability" (Donnadieu and Karsky 2002: 26-28). Sometimes, complexity means "random incidents, chance, initiative, decision, crisis, the unexpected, the unforeseen, and awareness of deviations and transformations" (Luca-Picione and Lozzi 2021: 19). Some other times, it means antagonism, emergence, dialogical loops, and multidimensionality (Morin 1977) or difference, change, paradoxes, entropy, threshold, and probability (Bateson 1979).

Ambiguity is a particularly interesting complexity factor for researchers working on cultural behaviors. Pop-Flanja and Gâz, for example, ask "to what extent can we regard ambiguity as being constructive or destructive in building cultural interactions and to what extent does communication need to be clear in order to be effective" (Pop-Flanja and Gâz 2015). ***Paradox*** is a second variable of complexity that deserves considerable attention from researchers working on immigration policies that have an impact on the cultural ecology of host countries (on this subject, see Daniel Côté's article in this issue). I am thinking in particular of immigration policies that have both legal and economic legitimacy, but nevertheless seem cruel from a moral point of view. The closure of the Roxham Road is a case in point. In April 2023, when the Trudeau government announced, apparently "without any warning, the closure to asylum seekers of Roxham Road" - a rural road that constituted an "irregular" border crossing between New York State (USA) and the province of Quebec (Canada) - many people *denounced the law*, lamenting that "hundreds or even thousands of migrants […] will suffer from this decision in the coming months" (Dorvil 2023). This case perfectly illustrates the anthropological complexity of situations where double bind is difficult to overcome. ***Uncertainty and unpredictability*** are also omnipresent factors of complexity in the field of intercultural communication, both from a methodological and theoretical point of view, and from the point of view of the cultural players observed in the research field. For instance, it is clear that the agreement between Canada and the United States that now applies to illegal migrants venturing onto Roxham Road means that people already weakened by difficult living conditions will now have to face the "uncertain ends of harrowing journeys", which is unacceptable, cruel, and inhuman: "They're nervous, they're scared […] They want a roof over their heads. They want their kids to be educated. They want to be able to put food on their table. They want to work. It's like, why wouldn't we be more open to that?" (Nasser and Boynton 2023). And yet, ambiguity, paradoxes, uncertainty, and unpredictability are features of human life that are not just reserved for people exposed to such extreme future conditions (De Luca Picione and Lozzi 2021).

It should be added that, in terms of human culture, all these factors of complexity can be observed in all spheres of activity (work, health, family, housing, security, education, culture,

spiritual life), and furthermore, at all scales of observation (individuals, groups, societies, the world). From a methodological point of view, this complexity presents intercultural studies "with the permanent challenge of reasoning in terms of models" (Walliser 2011: 7). As Floridi puts it:

> Instrumentally and predictively successful models (especially, but not only, those propounded by scientific theories) at a given level of abstraction can be, in the best circumstances, increasingly informative about the relations that obtain between the (possibly unobservable) informational objects that constitute the system under investigation (through the observable phenomena). (Floridi 2004)

As a corollary, I would say that heuristic models in the anthropology of intercultural communication only find their real usefulness when they reach a sufficient level of abstraction to inform us about the links that exist between the unobservable objects of communication. Put another way, the aim of heuristic models in our discipline is not to define essences or states of cultural matter "at a given time and in a given space", as classical physicists would do in the world of certainty, but rather to capture intersections of meaning *at a given level of abstraction and according to a given protocol*, as quantum physicists would do in the world of uncertainty. Within the framework of systems thinking methods, *models* are "artificial intelligible representations" (Le Moigne 1995: 15). Rarely do the models proposed by researchers have predictive, decision-making, or normative functions (Godin 2004: 815-816). Their value is more often descriptive than explanatory[11], and consequently they are "hypothetical rather than considered a valid expression" (Godin 2004: 815-816). It may be added that the models constructed by systemic theorists result from operations of "schematization of a complex reality, of which they offer an immediately legible image" (Godin 2004: 815-816).

For someone willing to acknowledge the striking insufficiency of non-formalized language for developing knowledge about cultural and intercultural communication, the need to think in terms of heuristic models or semiotic representations should now seem fully justified. It is from this premise that I now intend to take charge of the two objectives I have set for this essay. The first objective is to make explicit the conditions likely to ensure the heuristic value of a model built with words (rather than numbers, images, graphs or diagrams) (section 1), while the second aim (sections 2) is to clarify the operational function and level of abstraction required of certain terms necessary for the construction of heuristic models, such as "concepts", "categories", "headings", "models", "systems", or "theories", which are among the most commonly words used by academics in their descriptive or explanatory hypotheses.

1. Heuristic Model Validation Requirements

1.1. Two Principles to Be Observed

In anthropology, a theoretical model acquires heuristic value when it makes it possible to describe, explain and sometimes even anticipate relational behaviors that escape human perception in the field of experience, this, by detecting informational redundancies, extrapolating relational trends from observable processes or behaviors, and postulating possible changes in a niche of ideas. Bateson identified two conditions likely to ensure the heuristic value of such a model: compliance with the principle of *triadic comparability*, on the one hand, and compliance with the principle of *domain compatibility*, on the other.

The first principle, *triadic comparability*, is satisfied when a theory is developed thoroughly and consistently at each of the three levels of artificial systems: formal level, functional level, and processual level. Systemic theorists should always consider these three "types of comparability" to establish links between experiential reality as perceived, and the models under construction (Bateson 1972: 80-81). In this respect, Bateson's method of triadic comparison seems to be inspired by psychologist Kenneth Craik's hypothesis on *The Nature of Explanation* (1943), according to which the human mind elaborates mental representations in order to understand the *structure* or anticipate the

[11] About explanatory models, see Finke, P. and Bolig, M. (2014).

 doi:10.20944/preprints202309.0731.v1

functioning and *processes* that take place in the reality of the world. Bateson's triadic method of reasoning is even more closely aligned with the "trialectic of Being, Doing and Becoming" referred to by Le Moigne in his compendium of systems thinking (2006: 64). The triadic mode of comparison and reasoning is based on the principle that any definition elaborated within the systems paradigm must include "a functional definition (what the object does) [definition by its function], an ontological definition (what the object is) [definition by its form and structure] and a genetic definition (what the object becomes) [definition by its processes]" (Le Moigne 2006: 64). Correlation is therefore the result of a triple (not a simple) comparison. This is what we might call *perspective triangulation modeling* (Genest 2017).

The second condition to ensure the heuristic value of scientific theories and concepts is compliance with the principle of *domain compatibility*. This principle has something to do with the prior distinction of three major phenomenological domain that science set itself the task of elucidating: (1) the domain of inanimate matter; (2) the domain of the animate or "adaptive" world of organic or biological life; and (3) the domain of information, ideas, differences, and communication, which is dependent on the structure, functioning and processes of human cognition. We could perhaps use the terminology of the three spheres (geo, bio, noo) coined by Vladimir Vernadsky (1926) to refer to these three domains, but this would entail a lengthy discussion that is beyond my scope here. Instead, I suggest we speak of these three spheres as being respectively at distinct and increasingly higher levels of abstraction (levels 1, 2 and 3), while focusing on another aspect of their distinction that has major epistemological and methodological implications. Indeed, what is most important to recognize about these three domains of human experience is the fundamental differences in the laws that govern their organization, cohesion, functioning, and processes, respectively. The laws governing their evolution, first and foremost, could not be more radical: whereas the transformation of matter in the "geosphere" (domain 1) can be explained by a certain set of physical and chemical laws, it is a completely different set of laws that must be mobilized to explain the evolution of the adaptive and sensitive entities that animate the "biosphere" (domain 2), not to mention the fact that, since the advent of cybernetics and its major discoveries in the 1940s and 1950s, scientists have demonstrated that it is yet another set of laws - such as those of "order, negative entropy and information" (Bateson 1980: 23) - that are needed to explain processes in the sphere of human communication (domain 3).

The principle of domain compatibility is therefore the one that must guide our work when we develop a theory by *abduction*, i.e., when we structure our understanding of a phenomenon by borrowing a theory rooted in another domain of human experience. For example, to pose a problem of intercultural communication (domain 3) in terms of collision mechanics (domain 1) is to transgress the principle of domain compatibility, which necessarily leads to "pathologies of epistemology" and to the emergence of paradoxes from which it is not easy to escape later on (Bateson, 1972: 478). Bateson forcefully and persistently defended the original intellectual conviction of his own, now shared by many academics in the humanities and social sciences, that neither the foundations of Newtonian physics nor those of chemistry could be used to describe human behavior or mind, or to test heuristic hypotheses about it, or to confront in all their breadth and complexity the cultural problems debated by anthropologists (Bateson, 1972: xxii).

The two principles of heuristic model theory that have just been outlined should not only be respected by anthropologists in the construction phase of their models, but they should also be used to assess the heuristic value or potential of existing models. The following section presents an example of this application of the heuristic model validation requirements for evaluation purposes.

1.2. Assessing the Heuristic Value of Culture Shock Theory

In the field of intercultural communication studies, one of the predominant models is that of *Culture Shock* which I will use as an example in the methodological discussion that follows. My aim here is to see how we can methodologically argue that it is a misleading theory that has undermined anthropological research and theories on intercultural communication (Genest, Gouin-Bonenfant and White 2021). My opinion here is not based on the fact that it is "old-fashioned and therefore wrong",

as Dutton bitterly reproaches all those who disavow this concept (Dutton 2012: 216), but rather because it escapes the *domain compatibility* criteria of scientificity identified above.

Culture shock theories are based on one or other of the following three metaphorical constructions - physical (used by Choueiri 2008), medical (developed by Oberg 1960) and moral (denounced by Dutton 2012) - none of which is consistent with the informational and cultural nature of the phenomenon. For instance, the physical sciences metaphor evokes the physical impact of a collision between two concrete entities. This formal level of comparison gives force to the false impression that cultures are *concrete objects*. This may well have very little impact on the advancement of knowledge in the field, were it not for the propensity of each and every one thinker – from academics to politicians, to citizens, and so on - to spin this kind of expressive metaphor beyond its first expression. By shifting from a formal to a functional level of comparison, the physical metaphor was able to instill the idea that head-on intercultural encounters could cause psychic wounds, and that it was smart to guard against them. Obviously, this type of reasoning based on an inadequate metaphor cannot be qualified as scientifically admissible, even if it can be appreciated for its expressive potential in a literary context.

We could also look at the procedural level of comparison between the idea of shock and that of intercultural encounter, and quote Choueiri, who writes in an almost poetic construction (originally in French) that "cultures polish each other like pebbles on the shore and this operation is called culture shock" (Choueiri 2008: 3). In this case, interpreting the metaphor gives a representation of cultural groups and people as a kind of "shore pebbles" tossed about by the movement of the waves and experiencing the constraint of their mixing in giant "melting pot" – an expression that has long described the politics of cultural integration in the United States - while showing little resistance to the polishing of their behaviors, and the process of eroding their differences. Despite its genuine literary interest, this homonomy based on incongruous metaphor do not provide any honest explanation of how people react, interact, or simply relate in a context of super-diversity. We could repeat the same exercise by examining the heuristic value of this concept seen under the angle of the medical metaphor or the moral metaphor to illustrate the type of epistemological errors of which Bateson speaks in connection with the ill-formulated concepts. A corrective would be to reconstruct our representation of the difficult experience of sudden cultural uncertainty (hitherto referred to as culture shock) by seeking a new analogy rising to an "equally abstract level" (Bateson 1972: 83), i.e., using a metaphor drawn from the field of communication and information.

1.3. Relying on our Experience of the Information World

Among the various possibilities open to the intercultural communication researcher looking for an inspiring and heuristic metaphor drawn from the field of information (domain 3), that of the computer analogy often comes first. Geert Hofstede is one of the renowned scientists who envisioned culture through this perspective: "with a computer metaphor [he said], culture is the software of our minds. We need shared software in order to communicate. So, culture is about what we share with those around us" (Hofstede n.d.). Although this computational metaphor is at the same level of abstraction as the intercultural experience we are trying to theorize as anthropologists (domain 3), it would be problematic to see it as a solid foundation for a theory of intercultural experience since it eliminates of the equation the data of human behavior and psychology (in particular those which are of an emotional nature). The task of replacing the metaphor of "shock" with one drawn from the "world of meaning, organization and communication" (Bateson 1979: 202), to return to our example, does not mean ignoring the emotional intensity of the experience of cultural disorientation, insecurity, or uncertainty it sought to express. Nor is this to deny the quality of the empirical work carried out to date on this phenomenon, nor to cast doubt on the adaptation cycle that this research seems to have confirmed (Gouin-Bonenfant 2018; Ward, Bochner and Furnham 2001).

It is for these reasons that, in my own work, I have turned to another informational metaphor, also drawn from the sphere of communication (domain 3), but considering the effects of uncertainty, anxiety or insecurity that any new encounter can induce in the human experience: that of the *emergency alert system*. It has great heuristic potential as it provides a comprehensive source domain

 doi:10.20944/preprints202309.0731.v1

for the construction of formal, functional and process comparisons, as well as models relating to the sources, conditions, degrees, functioning, movements or evolution, management, causes and effects of uncertainty in the information circuits, without forgetting to examine the methods for estimating the risks and the intervention protocols. Interestingly, this metaphor was partially used by Mr. Frederico Mayor, Director-General of the *United Nations Educational, Scientific and Cultural Organization* (UNESCO), at the opening of the Eighteenth Congress of the *International Federation for Parent Education* (IFPE), in Paris, on May 25, 1994. The specific theme of the congress was "*the family amid current upheaval*". In a context of uncertainty, Mayor said that "to remain true to its mission, [UNESCO] must, above all, be on the watch, sound the alarm and help people to make a diagnosis and prescribe treatment in good time". (Mayor 1994).

As part of my own research into the cultural vigilance behavior adopted by a majority of long-established French-speaking Quebecers (for historical reasons, among others), I modified all my wording to adapt it to this new metaphor of *emergency alert system*. Rather than talking about xenophobic behavior or ideas, for example, I prefer to talk about intolerance to factors of complexity (more specifically to ambiguity, paradoxes, and uncertainty), and consider that this only manifests itself when it is triggered by the recurrent observation of differences whose meaning or significance in terms of change is not necessarily - or not immediately, if ever – understood. This led me to draw the following conclusion:

> Situating the concept of "culture shock" within the broader context of theories of change […] seems to offer [a new formulation of its theory]. This formulation is part of a theory of logic-type changes that occur in human cognition when a paradoxical communication situation disrupts its adaptive functions (Bateson1972). This path of theoretical development, based on systems thinking, makes it possible to elaborate an explanation that does not presume the positive or negative outcome of the "shock" experience, that can be used at different scales of analysis (individual, group, human), that transcends the specialized vocabulary of psychology and remains close to the concerns of anthropology (Genest, Gouin-Bonenfant and White 2021).

Having achieved my first objective which was to make explicit the conditions likely to ensure the heuristic value of a model built with words, I now propose to take on the second which consists in clarifying the operational function and the level of abstraction required of certain terms necessary for the construction of heuristic models.

2. Systemic Formalization Method for Heuristic Model Design

The second aim of this essay is to clarify the operational functions and required levels of abstraction of certain terms such as *concepts*, *categories*, *headings*, *models*, *systems*, or *theories* that are among the most commonly used by academics in their descriptive or explanatory hypotheses. To achieve this second objective, I propose to create cognitive meta-categories to identify their roles in the reference grid we use to classify our ideas while designing our representations of the world, and to specify the place we give them in the construction of our heuristic models. To illustrate my point, I will use a mathematical metaphor, which is at the same level of abstraction as the intellectual phenomenon I want to represent, this to respect the principle of domain compatibility, on the one hand; and which I intend to develop in terms of form, function, and process to respect the principle of triadic comparability, on the other.

2.1. Three Functions of Abstractions in Heuristic Model Design

Just as mathematics is made up of numbers, anthropology of intercultural communication is mainly made up of words, which makes language, labelling and wording essential elements and procedures in the progression of knowledge in the human and social sciences, despite the difficulties this can represent. To help, the following terminology is based on the congruence I propose to build between numbers and words, or more precisely, between numbers and scientific wording. According to its lexicographic definition, the idea of *Number* is the "basic concept of mathematics, one of the

fundamental notions of understanding that can be related to other ideas (plurality, set, correspondences) but cannot be defined" (CNRTL). I suggest considering the concept of *Wording* as a conceptual equivalence that would be specific to the field of the human sciences, that is, as a fundamental notion of understanding that is necessary for the engendering of several disciplines including philosophy, languages, literature, history, the arts, psychology, geography, political and legal sciences, communication, management and no doubt, anthropology. This intuition that the concept of wording can congruently echo the mathematical concept of number must be reinforced by the establishment of a contiguity of functions, which implies the possibility that each of them can be used in three different ways: the nominal way, the cardinal way, and the ordinal way. In mathematics, these three qualifiers are defined as follows:

> Nominal numbers name or identify something (e.g., a zip code or a player on a team.) They do not show quantity or rank. Cardinal numbers, known as the "counting numbers," indicate quantity. Ordinal numbers indicate the order or rank of things in a set (e.g., sixth in line; fourth place)12.

My proposal is to enrich the terminology of the heuristic model method with these three qualifiers, and to consider the possibility that theoretical words in anthropology may also be of a nominal, cardinal, or ordinal type, depending on the function attributed to them by a researcher in the process of constructing a heuristic model. I suggest reserving the use of the nominal meta-category for the classification of words used *to relay information*, reserving the cardinal meta-category for the classification of words used *to grid the territory of ideas* under study, and reserving the ordinal meta-category for the classification of words used *to map thresholds* of systemic change. In what follows, each of these three meta-categories of words is examined and illustrated by examples of application in the field of intercultural communication research.

2.2. Relaying Information with Nominal Wording

In the context of my proposal, nominal words are comparable to nominal numbers: they are labels used to identify objects in a more or less arbitrary way for the convenience of exchange between those who use them. In this perspective, we could compare nominal words to the digits of a telephone number: their actual numerical values are irrelevant, as they do not indicate quantity, rank, or any other measure. Similarly, the actual meanings of nominal words are irrelevant to the scientific study of informational reality within a niche of ideas since their role, within communication, is the same as that of a stick in a relay race: each participant can develop a personal style and go in any direction, as long as he or she is in possession of the stick.

When we begin to study a certain niche of intercultural communication, collecting the main nominal words, concepts or expressions amounts to noting the recurrences that characterize the communication process. The verb "to collect" is to be understood here both in the anthropological sense of collecting ethnographic data, and in the more trivial sense in which a collector of foreign currency, for example, might understand it. That is, as the act of bringing together objects that are more or less disparate in terms of spatial or historical affiliation, form, or value, but which play the same role as a means of exchange in the course of human activity. In such a collection, objects are assembled but not necessarily classified in any other way than by the collector's motivation. In my study of cultural vigilance behaviors in Quebec, the disordered collection of nominal concepts includes the following words and expressions: "conspicuous religious symbols", "reasonable accommodation", "charter of values", "ban on religious symbols", "discrimination based on religion", and "equality of women and men".

It is tempting to think of these words with nominal functions as *keywords* of the kind we use in research. However, this is not the case. While keywords have a functional value insofar as their meaning is restricted and indisputable (which makes the word "relation" an unusable keyword in the

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12 On line : https://www.infoplease.com/math-science/mathematics/numbers-formulas/cardinal-ordinal-and-nominal-numbers

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context of academic research), words with a nominal function should be considered more like hashtags on today's social media: they are "particularly useful in unmoderated forums that have no formal ontological organization. Hashtags help users find content of similar interest" (online definition[13]). In this frame of reference, "culture shock" is an example of an expression with no other function than nominal, which has not prevented it from being incorporated into numerous scientific models and theories.

2.3. Squaring the Territory of Ideas with Cardinal Wording

Understood in the philosophical sense of the term, the adjective *cardinal* attributes to a concept the "role of hinge, which serves as a pivot, thus forming, figuratively speaking, the essential part around which everything revolves" (Godin 2004: 168). Plato, for example, identified "justice, wisdom, temperance and courage" as the four cardinal virtues of his time (428-347 BC). Pascal spoke instead of "three orders of things: the flesh, the spirit, the will" (Bouchilloux 2015: 15). As for the French existentialist philosopher, Jean-Paul Sartre, he asserted, in his most important work, *Being and Nothingness* (1956)[14], that "*Having*, *doing*, and *being*! are the cardinal categories of human reality. Under them are subsumed all types of human conduct" (Sartre 1956: 431). Apart from a slight displacement effect, Sartre's categories are echoed in Jean-Louis Le Moigne's compendium of systemic thought in which he claimed that the "trialectic of being, doing and becoming […] is undoubtedly the key to the representation, if not to the very knowledge of the object" (Le Moigne 2006: 64). Finally, in his book *God and Golem, Inc* (1963), the well-known father of Cybernetics Norbert Wiener structured his thoughts on the "theme of creative activity [...] under a single set of concepts" that retain the properties of cardinal categories: Knowledge, Power, and Worship (Wiener 1963: 95). These set of cardinal categories enable him to create a term-by-term equivalence between what he identifies as the three pillars of human thought, on the one hand, and the three pillars of cybernetics, on the other: "Knowledge is inextricably linked to communication, power to control, and the evaluation of human objectives to ethics and to the whole normative aspect of religion" (Wiener 1963: 3). Considering the usefulness of having a stabilized and concordant list of cardinal categories in mind to grid the territory of informational objects when studying a complex and abstract niche of ideas, I will propose four in the next section, specifically chosen for the construction of a heuristic model for research in the anthropology of intercultural communication.

2.3.1. A List of Four General Headings to Start With

Among the pertinent suggestions made by anthropologists and philosophers, the list of principal headings that seems to me to be the most comprehensive, explicit, and best suited to the human behavior sciences is set out by André Comte-Sponville in a publication in which he attempts to answer the question *Is capitalism moral*? (2006). What Comte-Sponville calls *orders* - in the philosophical sense in which Blaise Pascal defined them in his *theory of orders* - are presented in the table of contents of his book in the form of the following numbered headings:

1) The techno-scientific order
2) The legal-political order
3) The moral order
4) The ethical order

Comte-Sponville's four "orders" can easily be likened to four of the headings used by cultural anthropologists to subdivide their fields of expertise, as shown in Table 1. However, at this early stage in the construction of a heuristic model, it is important to remember that the headings we have chosen as a point of departure are not yet *cardinal categories*, since to become so, they will eventually have to be integrated into a complete system of representation and put to the test of informational

[13] https://academic-accelerator.com/encyclopedia/hashtag

[14] This book (*L'être et le néant*) *was first published* in French in 1943.

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reality. For the time being, this is still just a vague guideline useful for grasping the complexity of cultural experiences. As Bateson reminds us:

> Our categories 'religious,' 'economic,' etc., are not real subdivisions which are present in the cultures which we study but are merely abstractions which we make for our own convenience when we set out to describe cultures in words. They are not phenomena present in culture but are labels for various points of view which we adopt in our studies. In handling such abstractions, we must be careful to avoid Whitehead's "fallacy of misplaced concreteness" (Bateson 1972: 61-64).

Now, if we consider the list from the point of view of informational realism, it is clear to me that it lacks something that could correspond to a whole area of anthropology classified under the heading of communications. This includes the study of the experience of art, symbols, information, magic, drugs, dreams, lies, and why not schizophrenia, difference, and change. It is true, however, that Comte-Sponville remains dubious about his fourth heading, not least because there's an ambiguity between the moral order and the ethical order that he needs to clear up (which he does briefly by proposing that "moral" means everything we do out of duty, and "ethical" everything we do out of love). His reflections on this problem ultimately lead him to "envisage a fifth order" under the heading of the *divine* or *supernatural*. (Comte-Sponville 2004: 69-72).

For my part, I have decided to combine the moral and ethical orders into a single heading, and to complete the list with a new heading revolving around epistemological questions, which seems to me sufficiently broad and abstract "to oversee the whole and ensure its cohesion" (Comte-Sponville 2004: 71).

Table 1. A first list of headings to describe culture in words.

Comte-Sponville's Headings	Specialties of cultural anthropology
Econo-techno-scientific	Anthropology of Technology & Science
Legal-political	Anthropology of Laws, Politics & Governance
Moral/Ethical (merged)	Anthropology of Moralities, Religions & Ethics
Epistemological (added)	Anthropology of Arts, Magic, Love.

2.3.2. From a List of Headings to a Grid Reference System

If the list presented above is interesting for its capacity to consolidate the links between our chosen headings (in the left-hand column) and the specialties of cultural anthropology (in the right-hand column), it seems unlikely to be useful for the study of intercultural communication. Not to mention that such a formulation - in the form of institutional structures, more precisely - runs the risk of confusing the names of things with the things themselves. This is problematic when you consider that the model under construction is intended to support research in a field where complexity factors are numerous and objects unobservable.

To avoid this pitfall, and to underline my choice as a systemic theorist to study the complexity of *informational and unobservable objects*, I propose to apply, here again, the principle of the triadic definition of artificial systems (or *perspective triangulation modeling*). The task is to supplement the list of headings formulated in terms of ***structural institutions*** with headings formulated in terms of ***functions***, on the one hand, and headings formulated in terms of ***processes***, on the other, while seeking their mutual relevance.

In Table 2, I present my own triadic formulation of headings adapted to the study of informational objects, for illustrative purposes only, followed by a few additional remarks. At this stage in the construction process, the reader must note that the headings become *orders* as a result of my desire to organize and grid my thinking through these "stable or recurring structures, and therefore recognizable and identifiable as a constant and necessary disposition" for the exercise of my thinking (Piettre 1995). It should also be pointed out that I work with a 12-square grid, whereas Bateson worked with "a lattice of nine squares [i.e.] three rows of squares with three squares in each row". Apart from this difference in *quantity* of squares - which suits the nomenclature of this grid of

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categories whose function is "cardinal" -, my reference grid is comparable to Bateson's in that, just like him:

> I labeled the horizontal rows with my culture elements and the vertical columns with my categories. I then tried to see each item as possibly belonging to each category. I discovered that it was possible (Bateson 1972: 85).

Table 2. Triadic wording of cardinal categories.

	(A) STRUCTURAL TYPE WORDING	(B) FUNCTIONAL TYPE WORDING	(C) PROCESSUAL TYPE WORDING
1	Instrumental Order	Shaping the world	Rationality Process
2	Normative Order	Ruling the world	Legitimacy Process
3	Moral-ethic Order	Sharing the world	Acceptability Process
4	Epistemological Order	Sublimating the world	Credibility Process

Once again, it is important to stress that these are not natural but artificial divisions of the "world of ideas and communication", since any cultural behavior can belong simultaneously to either of these categories, depending on the point of view of the person interpreting its meaning. Wearing a burka in a Quebec amusement park, for example, can at once be seen as a way of shaping, ruling, sharing, and sublimating the world, depending on who will interpret the meaning of this behavior, and it is precisely the possible ambiguity of interpretation that makes the situation so complex. Consequently, this set of cardinal categories should not be considered as a carbon copy of reality, but as "labels for points of view voluntarily adopted by the investigator" (Bateson 1972: 86), as a "grid reference system" for systemic theorists, similar to those used in topography or geodesy, i.e. as a mental and artificial division whose points of intersection alone are useful for composing the overall image of an information niche and for locating ideas in a mental territory. Indeed, it should be seen as a tool that guide the researcher's gaze and "'give [him] to see' without destroying the complexity or ambiguity of the [observed] phenomenon" (Le Moigne 2004: 147). From a methodological point of view, this type of theoretical construction makes it possible to process the enormous volume of information on intercultural behavior while repressing the disorder of our "rhapsody of perceptions", as Kant famously put it (1781). From a scientific point of view, the heuristic value of this grid pattern can only be appreciated when it is used in the spirit of a systemic or ecological vision of culture, that is, when it helps to understand how pieces of information relating to cultural behavior are distributed in a particular niche, and how cultural ideas hybridize, merge, and compete in people's cultural or intercultural discourse.

Further remarks should be added. When Malinowski and other anthropologists after him (including Bateson) denounced "the weakness of this method of subdividing a culture" into major or categorical functions (Bateson 1972: 62- 63), they were highlighting the danger of purely inductive models (from perceptions to categorization), which tend to reduce the complexity of phenomena and to precipitate the "multiplication of dormitive hypotheses" (Bateson 1972: xx). This suggests that the usefulness of functional headings or categories lies not in their heuristic potential, but rather in the service they provide in terms of data organization. It also invites anthropologists to engage in deductive reasoning.

By contrast, the processual formulation seems to pave the way for increasing complexity, insofar as each "square" of this *category of categories* grid is intended to classify not *differences*, but *differences of differences*, a famous expression coined by Bateson, referring to the *cognitive transformation of a perception into an idea.* This could have major implications for intercultural communication studies. This means that, if process-based categories have any heuristic value, they could provide us with a description of how a perception of an observable cultural difference (the wearing of Islamic veil, for instance) is ultimately transformed into a xenophobic or even racist idea. From a methodological point of view, this means implementing in research a range of reasoning modalities, including

induction, deduction, abduction, and transduction. To make this aspect more tangible for the reader, examples are provided in the following section.

2.3.3. Using The Grid for Classifying Ideas on Religious Neutrality in Quebec

In what follows, I give four examples of how I used, both inductively and deductively in circular reasoning, the model I call my *Anthropological Grid Reference System* to classify ideas reflecting Quebecers' cultural vigilance towards the growing religious diversity in their environment since the 1980s. Quotes are excerpts from the public hearing of citizens heard in winter 2014 as part of the public consultation held by the National Assembly's Committee on Institutions on Bill 60, *Charter affirming the values of State secularism and religious neutrality and of equality between women and men, and providing a framework for accommodation requests*.[15] In the context of these public hearings, citizens had the opportunity to state their reasons for supporting or opposing Bill 60, which was intended to prohibit "easily visible" religious symbols.[16] As the aim of my study was to highlight the testimonies of citizens from the majority group – who were mostly in favor of the bill - all the quotes embedded in the following section are from Caucasian adults (men and women), Catholics and Francophones, historically rooted in French European culture. Note that Bill 60 served as a basis for *Law 21: Act Respecting the Laicity of the State*, passed by the Quebec National Assembly on 16 June 2019. The purpose of this legislation is "to confirm the province's secular status, as well as to prohibit the wearing of religious symbols by civil service employees in positions of authority and by teachers in the public sector".[17]

In the economic order of behaviors and ideas, the category of *instrumental rationality* is intended to describe the cognitive process of matching objectives and resources as closely as possible to obtain the best results. When working with this cardinal category, my task was to classify all citizen comments aimed at denouncing the instrumental irrationality of the behavior displayed by people from other cultures. Once completed, this classification highlighted the fact that members of the cultural majority in Quebec generally worry about the presence of Others when a lack of congruence is found between their (extrapolated) instrumental goals and the (observable) means they use to achieve them. The first extract provides an example of this:

> We visited a mosque. First thing, they ask us to take off your shoes. What do you mean, take off our shoes? [This has no logical connection with the current activity]. But, before we got there, we had men, women with a little carpet rolled up under their arms and then... going in the mosque. At one point, I said: What's going on? There were men on all fours on the ground. There I looked, but there they were just men. Behind the curtain, there were only women. I could not believe it. I got back on the bus, then I said: Can you go and pray, on all fours, on a carpet? … !!! [It is a very irrational thing to do] (Mr. Pineault's wife, January 16, 2014, 17h00)

Normative legitimacy involves creating links between rights and obligations at the political or legal level of life in society. When working with this second cardinal category, my task was to classify all comments which aimed at denouncing the illegitimacy of the behavior displayed by people from other cultures. Once completed, this classification highlighted the fact that members of the cultural majority in Quebec generally worry about the presence of Others when they notice in their behavior a lack of congruence between "our" (legitime) rules, laws, principles, policies, or long-standing practices and "their" (deviant) behavior. The second extract provides an example of this situation:

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[15] https://www.thecanadianencyclopedia.ca/en/article/the-charter-of-quebec-values

[16] The full video recordings of these hearings and their transcripts (in French) are available on the Government of Quebec website: https://www.assnat.qc.ca/fr/travaux-parlementaires/commissions/ci/mandats/Mandat-24537/index.html

[17] https://www.thecanadianencyclopedia.ca/en/article/bill-21

 doi:10.20944/preprints202309.0731.v1

> What I think about Muslims is that they refuse to respect our rules. They ask to have their schools, their churches, and well: we have no problem with that. But they want us to be forced to respect the rules of their country. No one can decide overnight to change anything for their own good. Here, in Quebec, we refuse that our children walk around with a knife, we refuse women be beaten, we refuse slavery. We refuse to allow our children and even adults to wear a wool tuque, a hat, or a baseball cap in church. Everyone must respect these rules. (Mr. Pineault's daughter, January 16, 2014, 17h00)

Moral acceptability is more concerned with the links between behaviors and the context in which they are interpreted or justified (for example, we could accept that it is morally acceptable to kill someone in self-defense, but unacceptable in any other context). When working with this other cardinal category, my task was to classify all comments aimed at denouncing the unacceptability of the behavior displayed by people from other cultures. Once completed, this classification highlights the fact that members of the cultural majority in Quebec generally worry about the presence of Others when they notice a lack of congruence between a general (overt) behavior adopted by "them" and the context that our presence provides for interpreting it (from a personal point of view). The following extract illustrates this situation:

> The Hasidic Jews in my neighborhood, when I'd say hello to them, they'd look me in the face, then turn their heads, and never answer me [...] Very often, when we met them on the street, they'd change the sidewalk. So, I don't mind being open and trying to be nice to these people, but, at some point, you know, you say hello to them, and then they pretend you don't exist, it's rough. (Ms. Blanc, January 15, 2014, 11h30)

Finally, the central epistemological problem of art, symbols, information, magic, psychedelic drugs, dreams, lies, schizophrenia, difference, and change is certainly one of *epistemic credibility*, whose processes require respect for sacred thresholds that must not be profaned if the expected sublimating effects are to occur. When working with this last cardinal category, my task was to classify all the comments aimed at denouncing the unreliability of the behavior displayed by people from other cultures. Once completed, this classification highlighted the fact that members of the cultural majority in Quebec generally worry about the presence of Others when a lack of congruence is detected between the sublimated meaning of a behavior (provided to us by the other) and its profane meaning (suddenly discovered by us). The fourth extract provides an example of this situation:

> The veil is a religious symbol that sends a message of inequality between men and women in a society that advocates equality between men and women. To accept it is to support a double discourse, to support double, troubled, ambivalent, and anxiety-provoking messages. (Ms. Robert, January 2, 2014, 16h00)

As a methodological precept, a set of cardinal categories presupposes an equal probability that each will manifest itself to perceptions during field research. (Note that this was not the case for nominal concepts, which only become informative when they are recurrent). At this stage of the modeling exercise, the principle of equal probability is an important methodological postulate: it is what constitutes the heuristic tool provided by the model on the state of vitality of ideas in the ecological or cultural niche observed. However, in order to develop our model into an explanatory rather than a merely descriptive system, it becomes necessary to talk about the limits of each cardinal category, since in systemic or "cybernetic language, the course of events is said to be subject to *restraints*, and it is assumed that, apart from such restraints, the pathways of change would be governed only by equality of probabilities". In fact, adds Bateson, "the 'restraints' on which the cybernetic explanation depends can in all cases be regarded as factors which determine the inequality of probabilities" (Bateson 1972: 399-400).

2.4. Mapping the Thresholds of Change with Ordinal Wording

 doi:10.20944/preprints202309.0731.v1

So far, I have identified some key elements of a methodology for building systemic models in anthropological studies of intercultural communication by giving examples of possible applications drawn from my own research work on the cultural vigilance behaviors of the majority population in Quebec. After having presented the elements that seemed important to me with regard to nominal and cardinal formulations, I will now present in what follows some remarks on *ordinal wording*. This section will be shorter than the previous two, because most of what needs to be said about the "ordering" of cardinal categories - i.e., their hierarchical organization (ascending or descending, or both) - when designing a heuristic model has been set out in Comte-Sponville's book in the form of the problem of the limits of orders in philosophy, or both) - when designing a heuristic model has been set out in Comte-Sponville's book in the form of the problem of the limits of orders in philosophy, by cybernetic authors in the form of the problem of constraints in information theory, and in Bateson's intellectual work in the form of the problem of the *subjugation of the mind* by paradoxical communication (double bind theory). Nevertheless, I can summarize the main principles underlying this new phase of heuristic systems modeling, which should lead to the development of a model that is no longer merely descriptive, but also heuristic, explanatory, and systemic.

2.4.1. The Question of Limits

Each of four general categories identified by Comte-Sponville is linked by a predicate that limits its conceptual boundaries. These four predicates are presented in the form of dialectical structures that define the limits of each cardinal category: the opposition of possible and impossible structures the first one, the opposition of legal and illegal structures the second one, the opposition of good and evil structures the third one, and the opposition of joy and sadness structures Comte-Sponville's fourth (but not mine). Despite the nuances expressed by their respective models, Bateson, Comte-Sponville and others like Basarab Nicolescu nevertheless agree that two cardinal categories or orders "are different if, in passing from one to the other, there is a rupture of laws and a rupture of fundamental concepts", i.e., as soon as the threshold of relevance of a first predicate is reached in favor of a second (Nicolescu 2011: 95).

With these predicates in mind, the problem of limits is posed more or less in the following terms, which I take from previous research on *the change of state of mind in the ecology of cultures and ideas* (Genest 2022). To preserve the equilibrium of human organization, each order of thought has the role of limiting the authority of its (considered) lower order by imposing a new logic. Thus, the logic of "possible or impossible" is limited by the logic of "legal or illegal", which in turn is limited by the logic of "right and wrong", and so on. For example, we know that immigration to Canada is not limited by a logic of "possible or impossible" but by a logic of legal or illegal, while the moral logic of good and evil remains a tool of discourse aimed at limiting political powers, as we have already presented in the example of the closure of Roxham Road, at the beginning of the article.

2.4.2. The Question of Restraints

In systemic or "cybernetic" language, Bateson wrote, "the course of events is subject to restraints, and we must assume that, outside these restraints, the paths of change would be governed only by the equality of probabilities". In fact, added Bateson, "the 'restraints' on which the cybernetic explanation depends can in all cases be regarded as factors which determine the inequality of probabilities" (Bateson 1972: 399-400). In the context of my research, for example, this means that some restraints could prevent one of the model's orders of ideas from appearing in the environment made up of all intercultural ideas. This has to do with "the negative character of cybernetic explanation" [where] "information" is quantified in negative terms" (Bateson 1972: 402). To put it in few words: the more information is excluded from a communication act, the more informative it

becomes[18]. However, this is only observable if we have access to the context of the communication, since "without context, there is no communication" (Bateson 1972: 402).

It is another excerpt from the public hearing that will provide an example of this in the context of intercultural communication. The following is a quote of Ms. Céline Duval, provincial president of AFEAS, a women's association for education and social action in Quebec[19]. The situation described by Ms. Duval highlights the challenge that growing religious and cultural diversity poses to Quebec society for this grandmother and her granddaughter. In this excerpt, Ms. Duval expresses her concern as an educator about the presence of veiled women in her four-and-a-half-year-old granddaughter's environment.

> I'll give you an example I saw this summer with my granddaughter. We were at the zoo [in the city of Granby, Quebec] when, by the pool, she saw a lady who wasn't going to bathe because, in addition to the veil, she was wearing the whole big garment on [abaya]. So, my granddaughter told me: Grandma, why isn't this lady bathing? I gave a logical answer: She doesn't have a bathing suit. That was fine, until she said: But is a bathing suit expensive, Grandma? [As I understand it], her question was, if the lady doesn't have a bathing suit, maybe it's because she can't afford to buy one… At four and a half, she doesn't see the nuance, or the prohibition, or other aspects of the situation […] Then the woman's children got into the water, and the lady had to go in too to get them out of the pool. [This raised another question in my granddaughter's mind]: Grandma, did the lady remember to bring a change of clothes? She's going to get the car all wet when she boards […] My point is that what a child sees are not what we see [as adults]. It's certainly not what I saw. Rather, I saw something unfair. The husband and his children could go swimming, but the mother had to stay out of the pool.20 (Duval, January 16, 2014, 16:00).

This extract shows how the adult has excluded moral information in formulating his answers to the child. This suggests that a restriction of this order was imposed to information delivery by the communication context, which seems quite clear in the educational perspective announced by AFEAS. There are three more reasons why this extract is an exceptional example for my purposes. The first is that the four-and-a-half-year-old, through her questions, has set up instrumental and normative considerations in an ascending order in relation to our heuristic model. The second is that the grandmother tells us what she didn't tell the granddaughter about the moral order, giving us clues about the restraints imposed by different contexts. The third is the absence of any information relating to the last order of reality (related to epistemological processes) which highlights a restriction imposed by both the context of a private conversation and that of public hearings. The interesting question that must follows is *why*?

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[18] It recalls the paradoxical catchphrase "less is more" first coined by architect Ludwig Mies van der Rohe, representative of the *Minimalist movement* in the domain of visual arts.

[19] Founded in 1966 as a non-profit organization, AFEAS brings together 10,000 Quebec women who work as volunteers in 250 local groups in 11 regions of Quebec. This association affirms that all its members, without exception, favor equality between women and men, as well as a clear separation between state and religion. On the question of the challenge that growing religious and cultural diversity poses to Quebec society, and particularly to women from the majority cultural group (mainly French-speaking and secular or non-practicing Catholic), the position defended by AFEAS could not be clearer: "the Islamic veil is anything but neutral. It therefore has no place in children's educational environments".

[20] To read the transcript (also on video tape) of Ms. Duval's remarks on the Government of Quebec website and in the original language (in French), follow this link: https://www.assnat.qc.ca/fr/travaux-parlementaires/commissions/ci/mandats/Mandat-24537/index.html. The brief filed by AFEAS in December 2013 is also available at this address : https://afeas.qc.ca/pour-une-charte-integrant-laicite-et-neutralite-de-letat-et-balisant-les-accommodements-memoire-decembre-2013/

 doi:10.20944/preprints202309.0731.v1

2.4.3. The Question of Subjugation

Besides the questions of limits and restraints, there is a question of subjugation which is called the *tyranny* of orders over each other. Starting from the observation that there are realities of different orders - each having their domain, their logic, and their specific mode of action – the philosopher Blaise Pascal explained that the misunderstanding of human beings results from the confusion between these domains. Comte-Sponville (2004) sets out Pascal's theory of *tyranny*, *ridicule*, *barbarism* and *angelism* clearly and concisely, providing several contemporary examples of its consequences in society, so there is no need for me to return to it. There is, however, something important to highlight in the context of my remarks: despite the somewhat strange nomenclature used by Pascal and despite the fact that he was concerned with a different object of study (which is philosophy motivated by the question *What can we know?*), his matrix of ideas on the confusion of orders of thought, and their mutual subjugation is a *key principle* in *General system theory*. For example, we can correlate this with Bertrand Russel's theory of *logical types* (mathematics), Gregory Bateson's *double-bind* theory (psychology), and Basarab Nicolescu's axiom of *levels of reality* (which forms the basis of his theory of transdisciplinarity). All these theories are related, not only by their fundamental premise (the interweaving, through thought, of *a priori* incommensurable worlds), but also by a common objective to solve the problems of paradoxes encountered in the all-encompassing sphere of information.

I suspect that the same principle could be used to shed light on the paradoxes of *cultural appropriation in art*, which consists in thinking that certain artists who choose to decolonize their imagination by introducing idioms from different cultural groups into their works are instead, and paradoxically, perpetuating forms of domination against them. I could perhaps give this example, even closer to my work on cultural vigilance in Quebec, of the struggles raging in the Canadian arena of the debate between art (order 4) and public morality (order 3), which were raised by two controversial works by internationally renowned Quebec playwright Robert Lepage in 2018: *SLĀV* (in connection with slavery in the United States) and *Kanata* (in connection with the aboriginal question in Canada)[21]. In particular, it would be interesting to examine the Canada Council's policy statements (order 2) that identify artistic works as a potentially amplifying modality of "historical inequalities, stereotypes and exploitative relationships that have direct negative consequences on equity-seeking communities in Canada" (Canada Council for the Arts n.d.). For the time being, however, this is only one of my future directions for research.

CONCLUSION

The complete heuristic model, composed of nominal concepts, cardinal categories, and ordinal predicates are cognitive tools that I use as systemic theorist to facilitate and support the *denotation*, *description*, or *explanation* of complex phenomena such as intercultural communication. In my point of view, these three objectives are more than sufficient, and their assignment must be understood in relation to the research questions formulated in ecological or systemic terms by the researcher. As Bateson pointed out, it is not for academics to provide answers to "the sort of questions which administrators ask of anthropologists – 'Is it a good thing to use force in culture contacts?' 'How can we make a given people accept a certain sort of trait?' and so on" (Bateson 1972: 62). In keeping with an ecological vision of culture systems inspired by Bateson's work, it is necessary to highlight that the primary aim of heuristic model design is the schematization of complex situations in order to be able to locate the thresholds or "bifurcation points (that is, each moment of the present where the future appears unknown and many scenarios are equally probable)" where it will be necessary, for these administrators, to make decisions (De Luca Picione and Lozzi 2021).

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[21] In both cases, these theatrical works dealt with subjects which, according to the denouncers of these "cases of cultural appropriation", should have led to the presence, on stage, of representatives of the cultural groups in question (black people, first nation people). About the artist: Dundjerović (2019). About his controversial works: Lefrançois and Éthier (2019); and Uzel (2020).

 doi:10.20944/preprints202309.0731.v1

Although a systemic model can be used as an information base for crisis prevention, risk assessment or decision-making, heuristic models have none of these claims. As conceptual abstractions built from perceptions of informational reality, heuristic models do not claim to have the performative powers of other types of models, such as those used by economists, for example. The purpose of the heuristic kind of model for intercultural anthropologists is *ecological* because, rather than focusing on the behaviors, words, debates, opinions, arguments, or rhetoric that characterize ideas – an especially xenophobic ideas -, it focuses instead on relations between systems of thought and their environment. Indeed, in speaking of the ecology of mind, Bateson was referring to the "survival" of ideas:

> The questions which [my] book raises are ecological: How do ideas interact? Is there some sort of natural selection which determines the survival of some ideas and the extinction or death of others? What sort of economics limits the multiplicity of ideas in a given region of mind? What are the necessary conditions for stability (or survival) of such a system or subsystem? (Bateson 1972: xv-xvi).

With these questions in mind, I have sought to demonstrate the advantages of integrating systems theory into the examination of intercultural behavior and ideas, as well as to highlight some of the elements of methods for heuristic model design. In keeping with the theme of this issue, I have also endeavored to provide examples of the model's application to the cultural superdiversity generated by increased migration to Quebec. However, the level of abstraction at which I wanted to situate the model allows it to be used for descriptive or explanatory purposes in other registers of cultural interest, thus broadening "the scope of the inquiry". I therefore endorse Bateson's following suggestion that:

We should consider under the head of «culture contact» not only those cases in which the contact occurs between two communities with different cultures and results in profound disturbance of the culture of one or both groups, but also cases of contact within a single community. In these cases, the contact is between differentiated groups of individuals, e.g., between the sexes, between old and young, between aristocracy and plebs, between clans, etc., groups which live together in approximate equilibrium. I would even extend the idea of "contact" so widely as to include those processes whereby a child is molded and trained to fit the culture into which he was born […] (Bateson 1972: 64).

Examples of the model's application outside contacts between groups of different nationalities include contacts between different academic cultures within an interdisciplinary research team (Genest 2020), or contacts between different cultures of professional behavior within the same discipline, such as music, for example (Genest 2022).

At the end of this article and in the absolute, I agree that the heuristic value of a model is never demonstrable, and that it is up to each researcher to assume responsibility for his or her methods. As Bateson beautifully summed it up, "the point of the probe is always in the heart of the explorer." (Bateson 1979: 88).

S. Genest

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