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Empathy: a Unifying Approach to Address the Dilemma of 'Environment versus Economy'

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Abstract: When environmentalists warned, back in the 1970s, against pesticides and fertilizers, the then United States Secretary of Agriculture retorted that "before we go back to organic agriculture, somebody is going to have to decide what 50 million people we are going to let starve". This exchange is nothing but an illustration of the dilemmatic choice that societies in general have been asked to make: "develop the economy" or "protect the environment". This paper proposes an integrated framework to resolve the dilemma of 'environment versus economy'. This framework unfolds the essential characteristics of sustainable societies and outlines the mechanics that underlie sustainable development. Referred to as 'General Theory of Sustainability' (GTS), it is composed of 10 principles that make statements about a variety of issues including the limitations of systematic thinking and engineering methods, poverty, wealth-generating economic activities, economic theory, civil society and voluntary sector, gender, management of uncertainty and the physical environment. The common thread that weaves through all of these issues in the GTS is a fundamental concept that originated in psychology but is currently popular in other disciplines as well: the concept of *empathy*.

***Keywords**:* Systematic thinking, economy versus environment, sustainability, empathy.

1. INTRODUCTION

The environment has always been an integral part of the process of building and sustaining civilizations throughout history. It is the source of so many bounties ─ water, air, food, natural resources, energy, etc. ─ that are necessary for human civilizations to continue to exist. But the environment is like a coin with two sides; not only is it the source of bounties, but also of threats and challenges.

While some groups (big businesses and others) have downplayed the seriousness of these threats and challenges, there is enough evidence in the literature that environmental damage and dysfunctions represent a significant factor contributing to the collapse of many past civilizations (Diamond, 2006). In our modern world, there are many reasons to be increasingly concerned about the environment. Global warming and climate change, increased frequency of Atlantic hurricanes, huge build-up of toxic chemicals in the environment, depletion of natural resources, energy shortage are all depressing signs that have pushed the issue of environmental damage and sustainability to the top of the agenda of many political parties and governments' priority lists. Societies have become aware of the risk of a possible collapse and are now eager to act and avoid this risk, but face major difficulties in gathering a *consensus* among the concerned stakeholders as to what exactly needs to be done to remain sustainable. The Kyoto protocol (1997), Copenhagen Accord (2009), Alberta's oil sands project (Israelson, 2008), and the cod fisheries in Eastern Canada are but a few examples for which consensus over favoring the economy or protecting the environment has not been easy to obtain.

On one hand, pro-environment groups loudly denounce the destructive nature of many business-oriented activities and demand to reduce these activities to save the environment, but they don't seem to articulate what needs to be done to compensate for the wealth that will be lost as a result of this reduction. On the other hand, big businesses and their supporters remain relentless in pursuing profit and creating the wealth and jobs that our modern civilization needs to continue to exist in its complex and interdependent form, but they rarely provide convincing and integrated plans to save the environment from collapsing. The result is usually the undesirable situation where either the environment or the business is hurt. The exchange that took place during the 70s between environmentalists and a former US Secretary of Agriculture is a noteworthy illustration of this situation: when environmentalists warned against pesticides and fertilizers, the Secretary of Agriculture retorted that "before we go back to organic agriculture, somebody is going to have to decide what 50 million people we are going to let starve" (Goldstein, 2008).

This paper proposes a new approach to use when considering the dilemmatic choice that societies have been asked to make: "develop the economy" versus "protect the environment". A basic premise that underlies this new approach is that we need not sacrifice one for the other: not only can organic agriculture feed an entire population, but the principle of developing the economy and protecting the environment at *the same time* can be applied across the board to all sectors of economy, if the society wants to do so. The approach that we propose in this paper focuses on the smallest entity that makes up a society: *the individual*. It is argued in this approach that individuals with the appropriate attitude and behaviour *towards each other* will give rise to a sustainable society that is highly sagacious, yet constantly innovating and discovering new options (at the social, political, economic and technological levels) to effectively manage the dilemma of "economy versus environment". To explain the mechanics that will allow such a sustainable society to emerge, a ten-principle framework, referred to as the 'General Theory of Sustainability' (GTS), is introduced in this paper. GTS implements a fundamental concept that originated in psychology but is currently popular in other disciplines as well: the concept of *empathy*. By linking the process of resolving the issue of poverty (Principle 5Side Effect I in Principle 5 below) to the process of properly managing/using the physical environment (Principle 5Side Effect II in Principle 5 below) through the nurturing of *empathic skills* across all classes of the society, GTS captures the essence of how sustainable development can be achieved. Before we present the GTS (Section 4), we first provide a historical background of the concept of *empathy* (Section 2), and explain why and how empathic skills are needed to achieve sustainability (Section 3).

2. HISTORICAL BACKGROUND OF THE CONCEPT OF EMPATHY

According to the New Dictionary of Cultural Literacy (2002), the concept of empathy refers to the process of "*identifying oneself completely with an object or person, sometimes even to the point of responding physically, as when, watching a baseball player swing at a pitch, one feels one's own muscles flex*" (Hirsch et. al., 2002).

The term empathy was coined by American psychologist Edward Titchener in 1909 as a rendering of the German word *Einfühlung*, which was in turn introduced by German philosopher Robert Vischer in 1873 (Wispé, 1987). While Titchener (1924) defined *Einfühlung* as a "process of humanizing objects, of reading or feeling ourselves into them", this German term was originally used by Vischer in aesthetics (the branch of philosophy that deals with the nature and expression of beauty, as in the fine arts) to designate "the projection of human feeling on to the natural [or physical] world" (Pigman, 1995). For instance, to truly appreciate a work of art, one should imaginatively put oneself in the context of that work, time and place of that work. For the last quarter of the 19th century, the term *Einfühlung* remained focused on the process of perceiving and understanding *the non-human*, until another German philosopher, Theodor Lipps, extended its application in 1903 to the issue of how we get to know others, and described it as the source of our knowledge about other individuals. Thus, Lipps is the one who is credited with organizing

and developing the theory of *Einfühlung* for psychology and, as was indicated above, Titchener with introducing the concept in the Anglophone academic world under the term 'empathy'. During the last hundred years, the research on empathy has spanned several disciplines including not only the traditional ones such as social, developmental and clinical psychology, and philosophy, but also business management, sales and marketing, construction and civil engineering (Valero and Visiland, 2006), and engineering education (Rowland, 1989).

3. EMPATHY TO ACHIEVE SUSTAINABILITY: WHY AND HOW

Addressing the dilemma of "economy versus environment" is equivalent, in essence, to finding the way to sustainable development by taking into account the three bottom-lines (economic, environmental, and social). To deal with the complexities of "sustainable development" and the challenges that are associated with it, several computational approaches have been investigated by researchers, ranging from advanced statistics and knowledge engineering, to artificial intelligence and computer simulations. Based on mathematical models, these are *bottom-up* methodologies that attempt to look at the basic data sets about the (environmental, economic, business or social) phenomena under study, infer useful information for guiding the process of moving out of un-sustainability, and thus build a body of knowledge for developing plans and policies for sustainable development to be used by professionals and policy-makers. In many cases, these methodologies provide insight into the dynamics of the systems and phenomena under study, and can be of substantial help to policy makers. But they have a number of limitations that cause them to fail miserably in real-world situations, which tend to be dominated by a high degree of non-linearity (i.e., governing variables do not change in a proportional way) and by a large amount of uncertainties. For instance, they failed to predict or help prevent the dramatic collapse of the once plentiful cod fisheries in Easter Canada in 1992 (De Alessi, 2008), as well as the severity of the 1974-1975 and 1981-1982 recessions in industrialized countries (Greenwald, 1994). They also fuel a great deal of debate in the area of climate change, as they don't seem to provide clear explanations to the numerous uncertainties around the possible impacts of climate change such as, for example, the rise of the sea level (e.g. Oppenheimer and Alley, 2005). More recently, they have been blamed, at least in part, for the subprime financial crisis, as they failed to spot this crisis before it happened (e.g. Rickards, 2008). Some researchers attempted to explain the reasons behind such failures (e.g. Guergachi and Boskovic, 2008), and pointed out that, while extra research on these bottom-up mathematically-based methodologies will definitely contribute toward the enhancement of their effectiveness and expand their applicability, there is *no* chance for these methodologies to meet, on their own, the challenge of *fully* understanding and predicting the changes in highly complex systems such as, for example, the climate or the stock market. A *Top-down* approach must also be developed and investigated to complement the bottom-up mathematically-based ones. *This paper intends to propose* such a top-down approach in the form of 10 principles that make statements about a variety of issues including the limitations of systematic thinking (this expression is explained below in Section 4) and engineering methods, poverty, wealth-generating economic activities, economic theory, civil society and voluntary sector, gender, management of uncertainty and the physical environment. The common thread that weaves through all of these issues is the fundamental concept of empathy which, as described above, originated in psychology but is currently popular in other disciplines as well.

In this context, the hypothesis that we propose to examine is as follows:

The environmental and economic sustainability of a community as whole is closely dependent on the micro-interactions that take place among the individuals of this community; the more ***empathy*** *exists in these micro-interactions, the more sustainable the community will be.*

This hypothesis attempts to link a macro-phenomenon, which is sustainability, to indicators that are reported at the micro-level in the community. It looks at establishing this link in a way that is consistent with the principle of parsimony, which is *a major pillar of science*

(Outhwaite and Turner, 2007). Instead of associating sustainability with a long list of individuals' attitudes and behaviors such as, for instance, being environmentally-friendly and frugal, saving energy, using public transportation, eating healthy, being innovative at work, being honest and socially responsible, etc., we want to identify the smallest set of characteristics which, once they are met by a large proportion of individuals in the community, will lead to sustainability as a direct consequence. In this GTS that we propose in Section 4, we focus on one characteristic: empathy.

Empathizing versus systemizing:

In his book "*The Essential Difference: Male and Female Brains and the Truth about Autism*" (2004), Simon Baron-Cohen contrasted empathy with systematic thinking, and argued that people can be placed on a *mind continuum* (MiC) ranging from systematic to empathic. He also advanced his thesis that, *on average*, females are more likely to be on the 'empathic' side of the continuum, males on the 'systematic' side, and that autism is nothing but an extreme form of the male condition[1]. Within the proposed GTS, problem-solving approaches are also considered to form a *methodological continuum* (MeC) ranging from the purely systematic methods to the purely empathic ones. The GTS attempts to construct bridges between the two extremes of this continuum, by leveraging the MiC (i.e., the respective skills available in the female and male populations and the complementarities that exist among them) to help address the world's challenge of sustainability.

According to Baron-Cohen, systematic thinking "involves identifying the laws that govern how a system works. Once you know the laws, you can control the system or predict its behaviour". In essence, this is what the bottom-up mathematically-based methodologies (see our discussion above) are intended to do. To approach the dilemma "environment versus economy" (which is at the heart of the sustainability issue) using systematic thinking, one would formalize this dilemma as a *mathematical optimization problem*. A fast-growing economy generates a great deal of wealth, but damages the environment, while a slow economic growth will be gentle on the environment, but generates very little wealth; between these two extreme situations, there would be an *optimum* that we could search for using various mathematical optimization techniques. Identifying such an optimum is useful and can be successful when it focuses on small-scale cases, such as a small community or a specific lake for example. But, it will lead to nowhere if it attempts to tackle a large-scale, multi-dimensional, highly uncertain and nonlinear case, such as the world's climatic changes and energy/natural resources (it would indeed require a model of the real-world issue, which is very complex and can never be fully accounted for using any mathematical model ─ without even mentioning the usual obstacles that are posed by the so-called 'curse of dimentionality'). Thus, we need to start thinking beyond systemizing our problem-solving approaches, and reach out to empathic approaches. In what follows, we explain how we intend to do it, by stating the principles that underlie our GTS.

4. STATEMENTS OF THE PRINCIPLES OF THE GENERAL THEORY OF SUSTAINABILITY (GTS):

Defining the meaning of sustainability:

Before stating the principles of the GTS, it is appropriate to look first at the meaning of 'sustainability'. A number of definitions have been proposed for the term 'sustainability'. The most well-known definition is due to Brundtland (1987): *Meeting the needs of the present generation without compromising the ability of future generations to meet their needs*. This definition is, however, not very practical, because there is no way for us to obtain information about the generations that will live 500 or 1000 years from now, their

[1] This paper is not concerned with autism, but a few comments on the gender issue as it relates to sustainable development and the internal consistency of our GTS will be made later on in this paper.

technologies, their discoveries, their life styles, etc. This makes it impossible to define what their needs will be and, thus, difficult to operationalize the Brundtland definition. In addition to being impractical, this definition also looks a bit ironic: w*e did NOT even meet the needs of some people in our current generation*[2], and *we are thinking about the needs of future generations, whose circumstances are unknown to us.*

For the purpose of this paper, the following definition is proposed:

"A system is not sustainable if there is a (high) probability
for its current dynamics to lead to a crash (collapse)"

This definition can be applied to any *system*, whether it is a lake, a watershed, a business enterprise, a water management framework, a society, or a civilization. Also, it allows us to *parameterize* the task of assessing sustainability, by using different levels of risk and different types of crashes:

- we can define what we mean by a crash and select the severity of such a crash
- we can specify the probability at which the crash becomes a concern

Such a parameterization is useful for assessing sustainability through an interaction with the stakeholders. For instance, one can ask these stakeholders "what level of sustainability are you looking for?" (a question which can be addressed in terms of the severity of a crash and probability of this crash), in the same way as financial advisors regularly ask their clients "what level of risk can tolerate?"

Principles of the general theory of sustainability (GTS):

Now we turn to the principles of GTS. Note that no claim is made herein that the GTS is complete and the statements of its principles are final.

In the statements that follow, the expression "systematic thinking" covers the bottom-up mathematically-based approaches that are traditionally used in engineering and physical sciences, and that consist in developing systematic procedures, mathematical equations and/or computer algorithms to resolve the problem at hand. It also refers to Baron-Cohen's process of systemizing, as opposed to empathizing (Baron-Cohen, 2004).

Principle 1: Systematic thinking will ***not*** be able to comprehend all the complexities that underlie human nature, the wealth generation and distribution processes in fair economies[3], and many aspects of the physical world including climatic changes, weather patterns, and water cycle dynamics. It will not be possible to resolve the dilemma "environment versus economy" using systematic thinking alone.

Principle 2: The concept of empathy can be broadened to become the process of identifying oneself with not only **(1)** the non-human (i.e., objects such as a painting, a novel, a music, a product, etc.), and **(2)** the human (other fellow citizens), but also **(3)** the abstract laws that govern the physical and environmental systems. Under this extended definition, empathic skills, when they are honed correctly and utilized towards these abstract laws, can become a source of knowledge (which may remain in an implicit form) about many of the systems around us. The idea of having humans empathizing with the laws of nature (as opposed to just objects and humans) may seem strange, speculative or metaphysical, but it should not be seen that way, because it is epitomized everywhere

[2] Over one billion people in the world lack access to safe water supplies. Roughly two-million people die each year of diarrhea caused by infectious water-borne diseases (Secretariat of the Convention on Biological Diversity, 2010).

[3] Note that we used the expression "fair economies", not "market", "planned" or "mixed" economies. It might be possible to create an economy where the wealth generation and distribution processes are in the hand of a small number of people, in which case wealth generation and distribution will be easily captured and predicted using systematic thinking, but this type of economy would not be fair. Depending on the circumstances, a fair economy could be a market, planned or mixed economy.

around us: people learn to swim without having to study Archimedes' law of buoyancy or take a course on fluid mechanics, babies manage to stand up and walk without knowing anything about mechanics and control engineering, and many basketball players are able to score far away from the basket while they know nothing about Newtonian physics! It is possible to acquire highly complex knowledge about the systems around us without resorting to systematic thinking.

Principle 3: Empathic skills will ***not*** excel over systematic thinking in the cases where this thinking can be successfully utilized (e.g., most areas of engineering, computing sciences, etc.). However, empathic skills may achieve better results in the cases where systematic thinking fails (e.g., the case of resolving the dilemma "environment versus economy").

Principle 4: While individuals of a society should strive to learn how to empathize with objects [**(1)** in Principle 2] and with the abstract laws that govern the systems around us [**(3)** in Principle 2], empathy towards the human [**(2)** in Principle 2] is the ***most crucial one*** for two reasons:

Reason I : Empathic skills towards humans are relatively easy to learn and hone. This is because it is easier to identify ourselves with an individual from our own species than with a painting or with the laws of mechanics. We indeed know *how a poor hungry man feels* (as we may have experienced hunger and/or poverty before), but we wouldn't easily feel *how an object accelerates when it is hit by another object five times heavier* or *how fast it will take a tomato to biodegrade in our backyard*.

Reason II : Because empathy towards the human is easy to learn, hone and practice, it helps in developing the intellectual, mental and emotional abilities that are necessary for learning the empathic skills towards the non-human and towards the abstract laws of physical and environmental systems.

Principle 5: Economies, regardless of their type (market, planned or mixed, fair or not), are likely to produce the following negative side effects:

Side Effect I: some kind of poverty in the society

Side Effect II: some kind of impact on the physical environment

Principle 6: Attempting to address the side effects of Principle 5 *from within* the economic system, such as for example:

a) disallowing layoffs to ensure that poverty will not spread in society;
b) forcing businesses to eliminate the negative impacts on the environment by having them pay the costs of mitigating these impacts;

will end up, in the long-term, damaging the wealth-generating economic activities.

Principle 7: To address the two negative side effects of Principle 5 in a sustainable fashion, it is crucial that empathic skills are developed in the society at the individual level in a way that is consistent with Principle 4, i.e., individuals need to start by first learning, honing and practicing empathy towards humans, as it *is* the most important of all three empathies. Practicing empathy towards the human within the society *must* lead to the development of a space, ***outside*** the wealth-generating economic system, in which charitable giving and volunteering in all forms prevail. The development of such a space will, in turn, lead to solving or, at least, reducing the severity of Side Effect I in Principle 5. Thus, the economy will run in the society as if it was a *coin* with two faces: one face is the wealth-generating economic system which encourages *quality customer service*, *innovation*, *competition*, *efficiency and effectiveness*, *research and development*; the other face is the charity system whose goal is to address Side Effect I in Principle 5. At this point, the reader may recall that, at the very beginning of this document, we also described the environment as a coin with two faces: bounties on one face, and threats on the other one. Therefore, within our GTS, the economy and the environment are both viewed as two *metaphoric coins*.

Principle 8: Because of Reason II in Principle 4, success in solving or, at least, reducing the severity of Side Effect I in Principle 5 will help individuals in the society develop the intellectual, mental and emotional abilities that are necessary for learning the empathic skills towards:

a) the non-human, i.e., *objects which would include the physical products that are manufactured by the economy's businesses*
b) the abstract laws of physical and environmental systems, *in which the economy's businesses are necessarily embedded*.

These individuals, who would have learnt all three types of empathic skills, will be among the contributors (engineers, accountants, secretaries, technicians, salespeople, nurses, CEOs, etc.) to the wealth-generating economic system. When they get involved in product design, research, sales and marketing, finance and accounting, business development, manufacturing, and decision-making in general, they will act in a way that will not only satisfy the customer [empathic skills **(2)** in Principle 2] and produce quality products [empathic skills **(1)** in Principle 2], but also meet the environmental sustainability requirements [empathic skills **(3)** in Principle 2].

Thus, within our GTS, a society that runs an effective charity system (the second face of the economy's metaphoric coin) to eliminate or reduce the severity of Side Effect I in Principle 5 is expected to run a successful wealth-generating economic system in an environmentally-friendly fashion. In other words, such a society is expected to have solved the dilemma "economy versus environment".

Principle 9 – Taking into account the gender issue: In this principle, we start by pointing out the following two facts:

(1) Baron-Cohen (2004) advanced his thesis that most females are on the empathic side of the mind continuum, while males are on the systematic side of this continuum.
(2) Bankers working in the microfinance business have reported that, when women are involved in running sustainable development projects in developing countries, loans are almost always paid back on time, and the projects are successful (Attali, 2006).

Therefore, women's empathic skills [(1) in Principle 9] seem to contribute beneficially to the complex projects of sustainable development [(2) in Principle 9]. Principle 9's statement is thus: the lack of involvement of women in the process of resolving the dilemma "economy versus environment" may ***not*** lead to successful results.

Principle 10 – Management of uncertainty: Systematic thinking does *not* have the capability to handle *severe* or *extreme* uncertainties. When a society moves away from the path of sustainable development, uncertainties become more and more severe and, therefore, systematic thinking tends to fail. However, solving Side Effect I in Principle 5 through the implementation of Principle 7 and its consequence Principle 8, will lead to a reduction of the severity of uncertainty, thereby making systematic thinking discussed in Principle 1 applicable to a wider range of systems and issues and, thus, fuelling more economic growth – just as it happened at the time of the industrial revolution [when systematic thinking became established], but in a sustainable fashion.

5. CONCLUSION:

This paper proposed an integrated framework to resolve the dilemma of 'environment versus economy'. This framework unfolds the essential characteristics of sustainable societies and outlines the mechanics that underlie sustainable development. It is composed of 10 principles that make statements about a variety of issues including the limitations of systematic thinking and engineering methods, poverty, wealth-generating economic activities, economic theory, civil society and voluntary sector, gender, management of uncertainty and the physical environment. The common thread that weaves through all of these issues in the GTS is a fundamental concept that originated in psychology but is currently popular in other disciplines as well: the concept of *empathy*.

As part of future work, the authors intend to test and validate the 10 principles and the logic that binds them together, using socio-economic and environmental data from the OECD countries. They also plan to look at the issue of how one can teach empathy, if

empathic skills prove indeed to be critical for sustainability. Teaching empathy can indeed become a challenging task when there are significant political differences within a society.

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