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### Résumé de l'article

Since the mid-twentieth century, we live in the Information Age. An epoch prioritizing the primacy of information, on a par with matter and/or energy. This probe questions the primacy of information, explores the origin of syntactic information and discovers the ubiquity of our syntactic touch.

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## Syntactic Touch: A Probe

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**Abstract:** Since the mid-twentieth century, we live in the Information Age. An epoch prioritizing the primacy of information, on a par with matter and/or energy. This probe questions the primacy of information, explores the origin of syntactic information and discovers the ubiquity of our syntactic touch.

## Introduction

Greek mythology has many stories relating to Midas, the king of Phrygia (in modern-day Türkiye). One story relates to the capture of the philosophical satyr Silenus, a favourite of the god Dionysus, who was brought to king Midas. Soon after, Midas returned a liberated Silenus to Dionysus. As a result, Dionysus granted him one wish in recognition of his good deed. In response, king Midas asked for the power to turn everything he touched into gold. Very soon after he was confronted with the reality that it was not a blessing but a curse. It was an ability that no one should have, being unable to eat, drink or even touch his loved ones. Soon after, he begged Dionysus to take back his gift. “Dionysus took pity and ordered the king to cleanse himself of the remaining traces of his guilt in the source of the river Pactolus, near Sardis. Midas obeyed, and the power of transforming things into gold passed from his person into the stream, whose sands forevermore were sands of gold” (Morford and Lenardon 2003, 295). The moral: Greed does not end well.

We will now describe the notion of syntactic touch so that we can decide whether it’s a blessing and/or curse.

## Information

The concept of information has a long history of elusiveness that needs elucidation (Capurro and Hjørland 2003; Hofkirchner 2008), involving an irreconcilable difference that needs resolution. For some, information is considered an absolute quantity of the Universe in addition to matter and/or energy. Its existence is grounded on a postulate which some consider sufficient to bring it into existence (Wheeler 1991; Stonier 1997; Yockey 2005; Vedral 2010). For others, it is a relative quantity/quality, ‘a difference which makes a difference’ (Bateson 1978, 453), where “The essence of this definition is that information is something which is generated by a subject. Information is always information for “someone”; it is not something that is just hanging around “out there” in the world” (Hoffmeyer 1996, 66). Implying “that there is no information outside living beings interacting with their environments” (Gare 2020, 328). Given this Gordian knot, the resolution has to be sought by firsthand observation.

Figure 1 shows, central to the figure, a block diagram of the elements of the general

communication system underlying the Mathematical Theory of Communication (Shannon 1948), crucial to the establishment of 'Information Theory' as a discipline. The Information Source may be likened to a microphone into which a message is spoken to start the communication process. The Transmitter is an encoding device that makes the Message generated by the microphone amenable to transmission as a Signal over a wired or wireless Channel. The Channel is subject to accumulation of Noise from multiple Noise Sources. The Receiver is a decoding device that reconstructs the original message from the Received Signal. Finally, the Destination is the speaker that blares out the arriving Message. Shannon defines the fundamental problem of communication as "that of reproducing at one point either exactly or approximately a message selected at another point" (Shannon 1948, 379). This engineering analysis was devised to understand and solve the problem of communication, emphasizing the syntactics of communication, not the non-existent semantics of the message.

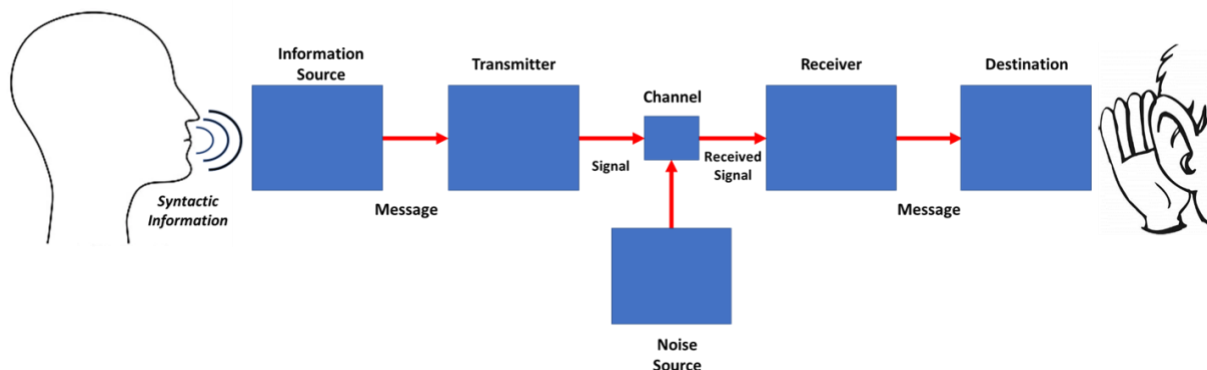


Figure 1 – The communication process [adapted from Shannon (1948)]

Looking at other elements of Figure 1 we find that this analysis excludes two important elements without which the communication system is irrelevant: the Sender and the Recipient of the message at the left and right end, respectively. Also, what needs further clarification is: how does the Sender of the message synthesize the message to convert it into the represented syntactic information that gets communicated? And how does the Recipient of the message interpret the communicated syntactic message? This communication system also describes how we talk directly to another person. In this case requiring that the Information Source and Transmitter be one with the Sender. Similarly, the Receiver and the Destination are internal to the Recipient. Without further elaboration, we observe that the Sender is capable of internally synthesizing semantic information relevant only to itself, and then externalizing syntactic information. The Recipient, upon hearing the message of the externalized syntactic information, interprets its content from their own unique perspective, and generates internalized semantic information, so as to be able to respond syntactically, if warranted. The same message might have different meanings to different individuals. In an attempt to gain some insight into the process of generation of semantic and syntactic information, let us reexamine information from two other perspectives. The first examines its etymological origin. The word information has the Latin stem *informare* (to inform) in the sense of giving a form to matter and communicating knowledge to others (Capurro and Hjørland 2003; Peters 1988). For an organism-in-its-environment this implies a dynamic outlook. There is a before and an after when the organism engages with matter/energy. For example, the Sender of the message above, uses its sound organs to manipulate air to create air pressure waves that allow it to form the needed message. A second analogous and dynamic perspective is that of Bateson's "difference which makes a

difference” (Bateson 1978, 453). Bateson’s conceptualization applies when observing nature around us as well as when acting on nature to determine the effects of our actions. Both conceptions of information define a self-referential, interactive, recursive, evolving, and never-ending virtuous dynamic spiral of sensation-information-action. The actions reflect the organismic capacity for relating to their environment motivated by satisfaction of physiological and/or relational needs (Cárdenas-García 2020, 2022a, b, 2023).

Figure 1 also hints at a more general interpretation. The generation of externalized syntactic information from internalized semantic information may also be achieved by more direct manual in-forming of matter/energy into useful objects. This may be construed as engaging in a process of syntactically ordering matter/energy. The media seems to be the message. Correspondingly, however matter is ordered syntactically, we should be able to interpret its form and function so that we can use it effectively. The implication is that not only are we able to communicate by our speech and writing, but we are also able to communicate by our creations in all areas of the Arts and Sciences. This also implies that most of what surrounds us is artificial and identifiable as syntactic information. This finding is demonstrably one of the most important results relevant to information and meaning-making, i.e., internal semantic information requires transformation into external syntactic information in an endless process of sensation-information-action if we are to live in a social environment. This is the origin of what we identify as our unavoidable capacity for syntactic creation, i.e., syntactic touch. Is it a blessing or a curse?

### **Some things to think about**

Figure 1 shows how generally a human being is able to interact with its environment by externalizing internal semantic information through external expressions using language, gestures, pictographs, musical instruments, sculptures, writing, coding, etc., which is syntactic in nature and corresponds to Shannon information. In short, Shannon/syntactic information is a metaphor for all human creations. This includes all our artificial creations in the arts and sciences and all human artifacts which surround us.

To gain a measure of what we mean when we refer to syntactic information elements in our environment, we quote Pattee when he states, “For my argument here, I will mean by matter and energy those aspects of our experience that are normally associated with physical laws” (Pattee 2012, 213). In other words, when we observe our environment and apply science and the scientific method to make sense of what we observe, we build an understanding that is based on our syntactic conceptualizations. We observe, experiment, and theorize using our syntactic creations, including mathematics, physics, and chemistry to gain access to the world that surrounds us so that we can change it in our own image to serve our needs. What this means is that all of what we discover and build is subject to interpretation by someone, so we have to teach every new generation how to understand and interpret our scientific creations. If for some reason this chain gets broken, for example when we were unable to decipher Egyptian hieroglyphic script. It was only because of the Rosetta Stone, the first Ancient Egyptian bilingual text recovered in modern times, that we were able to gain access to the inscribed knowledge. The explanations and practical achievements of science need to be constantly reevaluated since they all are the result of syntactic creation. In short, syntactic creation is only able to explain other syntactic elements in our environment. It cannot explain nor create life, an element in nature that is capable of semantic interpretation for its own

benefit as well as syntactic creation to close the circle of its metabolic connection with nature. This has the implication that all efforts to use chemistry to attempt to create life are doomed to failure (Miller 1953; Criado-Reyes et al. 2021).

“According to a new study, the mass of all our stuff—buildings, roads, cars, and everything else we manufacture—now exceeds the weight of all living things on the planet. And the amount of new material added every week equals the total weight of Earth’s nearly 8 billion people”. Roads, houses, shopping malls, fishing vessels, printer paper, coffee mugs, smartphones, and all the other infrastructure of daily life now weigh in at approximately 1.1 trillion metric tons—equal to the combined dry weight of all plants, animals, fungi, bacteria, archaea, and protists on the planet. The creation of this human-made mass has rapidly accelerated over the past 120 years: Artificial objects have gone from just three percent of the world’s biomass in 1900 to on par with it today. In addition, the amount of new stuff being produced every week is equivalent to the average body weight of all 7.7 billion people” (Pappas 2020).

Since the design, construction, and use of computing machines also fall under the umbrella of syntactic creations, it means that the nature of artificial intelligence (AI) is also syntactic. This would seem to put a damper on the potential for the achievement of artificial general intelligence (AGI), although this does not preclude the development of many interesting AI applications such as ChatGPT (Hutson 2022).

Another common argument that is made is that we live in a computer simulation (Bostrom 2003). This argument assumes the existence of an advanced civilization of unknown superbeings that has developed the computational capacity to simulate anything it wishes. The result is that they choose to simulate us and the world in which we live. Great effort in this argument is devoted to making the case that we are the product of someone’s imagination and creativity and are part of a computer simulation. This whole contention can be very readily dispensed with by noting that all computer simulations are syntactic in nature, whether by an advanced civilization or not. Therefore, we do not live in and were not created as part of a computer simulation.

I would encourage anyone to suggest counterexamples that will cure our inability to create other than syntactic information. Can we cure being blessed and/or cursed by syntactic touch? What is the moral of this story?

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