



## Extended Abstract

# The Consistent Principle of Information, Life and Cognition

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## Introduction

In Shannon' and Weaver's classical works, It implies that without selection, there is no information but possible states of world affair. In other words, information begins with selection. (Shannon, C. & Weaver, W., 1964, 9, 31) As there are different pieces of messages to choose, there must be a reason for the consumer of information to select this one rather than others. The reason is that the selected message can afford certain purpose of consumer. In Bateson's term, it can make a difference to consumer. It is consumer's selection that gives significance to message. Without consumer, there is no information as there is no significance. Hence, in order to understand significance of information, it is necessary to understand the self-conservation of consumer. I call this claim Consistent Principle. There are two versions of Consistent Principle: weak and strong.

The representative theory of weak version is John Collier's dynamic theory of information that "no meaning without intention; no intention without function; no function without autonomy". (Collier, J., 1999a; 1999b) Strong version is raised by Maturana and Varela in their theory of general biology of life and cognition: "living systems are cognitive systems, and living as a process is a process of cognition" (13); "all doing is knowing, and all knowing is doing" (Maturana, H. & Varela, F., 1987/1992, 26); "living systems are cognitive systems, and to live is to know" (Maturana, H., 1988) In this paper, I will introduce and compare these two versions concluding that weak version is acceptable.

## Weak Consistent Principle

I slightly change Collier's slogan to "no meaning without function; no function without intention; no intention without autonomy" basing on the reason that intention is necessary for function rather than the other way around. Then, Collier's slogan can be expressed as autonomy is the necessary condition for intention which is the necessary condition for function which is for meaning. In short, information originates from autonomy. First, meaning requires function. Generally speaking, the meaning of a sign is defined as what the symbol refers to or stands for in analytic philosophy. (Lycan, W. G. 2008, 3) With brilliant argument given by Frege (1892/1948), the meaning of a sign is discriminated into referent and sense. Referent is what the sign refers to and sense is the mode of presentation contained in the sign. It seems that there is no position for function in this dual structure of reference or meaning of sign in analytic tradition. Another insight from David Lewis (1970, 19) tells us that we should be careful about the difference between the description of possible languages or grammars as abstract semantic systems whereby symbols are associated with aspects of the world and the description of the psychological and sociological facts whereby a particular one of these abstract semantic systems is the one used by a person or population. Function and intention may exist in latter description but not former. So, why function is necessary to meaning?

The term function in Collier's context is inherited from behaviorism and functionalism that treating living system or brain as "black box" having certain software like computer that giving certain input will get certain output. (Putnam, H., 1991, 73) This idea is wrong as it ignores intentionality which is the very defining nature of living being and mind as Putnam criticized. (Putnam, H., 1991, 74) Therefore, functionalism actually is not about function itself. Hence, in order to draw back original meaning of function, I replace intention with function. In this context, function can be interpreted as the functional apparatus that can realize certain intentional purposes for living being.

If we take the dualistic position of analytic philosophy, it will lead to pan-semiotics that anything can be sign of other things since anything is in some kind of relation with others. Without function, the difference between sense and referent becomes tree without a root or water without a source. In this sense, "a sign that represents without thought might be a representation only in the sense that it can serve as such under the condition that it is so interpreted." (Collier, J., 1999a) According to Bateson's definition of information that information is a difference which makes a difference, only a causal process or natural world affair makes a difference for consumer to afford its/his intentional purpose, can it be information for consumer. As sign has intersubjectivity that can be read by any consumers in a same community, the sense or interpretation of a sign or language can be interpreted as proper function.

Intention is the necessary condition for function. Function is supposed to realize certain purpose with apparatus that can manifest the function. Then the question is where the purposes come from. Function is derived from intention. Intention here means that to want to achieve certain purpose or goals. It is living being's or consumer's individual will or desire. This is also true for functional organs of living system. Every function requires reference to intention. Intention is always intention of somebody or something living. Different from all physical and self-organization processes, living system has self-agency to maintain its self-identity. The desire of living to conserve itself produces the most primary intention. Hence, autonomy is necessary for intention.

## **Strong Consistent Principle**

Generally, when investigating cognition, we usually divide the whole situation into cognitive agent which takes cognitive action and the world affair the agent perceive. However, Maturana and Varela find that sensory organs of living system are not passively reflect the world like mirror. Instead, they actively select what they perceive. What the world can be perceived is determined by sensory organs' perceive capacity. Hence, seeing and hearing as perceptual processes are the actual acting or behaving of eyes and ears in their domain.

Then Maturana concludes that "A cognitive system is a system whose organization defines a domain of interaction in which it can act with the relevance to the maintenance of itself, and the process of cognition is the actual (inductive) acting or behaving in this domain. Living systems are cognitive systems, and living as process is a process of cognition." (Maturana, H., 1970/1980, 13)

In other words, "all doing is knowing, and all knowing is doing". In other words, living system is necessary and sufficient condition for information and cognition. The reason that past epistemologists cannot acquire this point is because they forget an important prime that "everything said is said by an observer". Actually, there are two levels of cognition happening in this case: one is the cognitive agent perceiving its surrounding environment and the other is observer observing the whole situation. Past epistemology confuses these two different levels that taking meta-domain as domain of cognitive agent. If we give up observer's perspective and just take cognitive agent's, what happens in cognitive process is nothing more than structurally determined process triggered by stimulates of world affair outside on sensory organs. Hence, biological processes of living being are enough to explain cognition and information as living process is knowing process and knowing process is living process.

## **Why Weak Version?**

Compared with weak version, strong version is not as persuaded as it looks like. There are two challenges it faces. The first one is that living system itself is an observer for itself distinguishing itself from its surrounding environment. This is an inner contradiction in the argument of original works of Maturana and Varela. On the one hand, when defining the living system, they says that "the most striking feature of an autopoietic system is that it pulls itself up by its own bootstraps and becomes distinct from its environment through its own dynamics, in such a way that both things are inseparable" (Maturana, H. & Varela, F., 1992, 46-47). Living system is an observer for itself. On the other hand, they say that the distinction between living system and the domain it embodies is made by the meta-observer with the epistemology of "everything said is said by an observer". However, when they come to the conclusion, the fact that the living system as an observer of itself is overlooked, and inferring that the distinction is made by meta-observer and what happens for living system is nothing more that structurally determined processes. Then, living and cognitive processes are reduced to determined biological processes. If the distinction is not real and we cannot separate living and cognitive processes from other structurally determined processes, then there is no reason to suppose living and cognitive processes are special processes essentially different from other causal processes. Therefore, this biological reductionism is unacceptable as it ignores inner purpose of self-identity of living beings.

The second challenge strong version faces is that the sign employed by living beings to perceive the world outside and communicate with others is intersubjective and normative. In dealing with the problem of interaction between living system and others, Maturana and Varela explain this process as structural coupling. For living system, any structural changes triggered and selected through its recurrent interactions with others, no matter taking action upon surroundings or communicating with other living beings, are structural coupling in essence. Normally, when explaining language, people divide language into denotation and denoted or even further analyze sign into representamen, interpretant and object as Peirce did. However, this is a classification made by meta-observer, not what actually happen in this process. In this way, Maturana and Varela reduce information and communication into structural coupling which is a biological process essentially. However, it is hard to explain normativity of symbols through this way. Different from actually realized purpose, proper function or purpose of sign is supposed or designed to achieve. It does not mean it can realize the purpose supposed to. In other words, it can be mistake. There is no way for biological reductionism to explain why misinformation is possible.

With these two challenges above, strong version of Consistent Principle is too strong to interpret information. The problem of it is that it reduces intentional and normative level of information into causal or biological level. Without intention, living system becomes an autonomous machine without soul; without normative level, flexibility of representation capacity of sign is lost and communication is impossible. Weak version of Consistent Principle is necessary for understanding information. Because there is hierarchical structure from living to meaning, so a transdisciplinary framework is needed to explain information with respect to consistent principle.

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