

***Res Computans*: The Living Subject from Yeast to Human**

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Abstract Since modernity, the concept of subject supposes both an anthropocentric and a dualistic view of life and reality. In this study, we carry out an analytic interpretation of the Descartes' notion of subject, in order to build a different dimension of the concept of subject. We discuss the activity of computing, as the manner by which the living subject relates with and in-forms the world. We further examine computing in the aging yeast as an example of living subject and we try to comprehend the maturity of the subjectivity in Descartes' *res cogitans* and in our proposed *res computans*.

Keywords Aging · Cartesian cogito · Cell survival · Cognition · Subjectivity

1 Introduction

Cartesianism has put the human subject in a privileged place above both the object and the other living beings. In the present work we aim to analyze this concept of subject contributing to a reconstruction of its notion. For this purpose we try to develop a turn from the Descartes' thinking thing to the living thing, considering diverse contemporary views and authors which support that subjectivity is intrinsic

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to the proper logic of the living being. This means an operation from which a new subject and a different action of subjectivity could substitute that of the *res cogitans*.

We firstly propose a survey on Descartes notion of thinking, and on the relations of the Cartesian subject with the world and with the life, trying to identify the intentions and tensions contained in the term *res cogitans*.

In a second part of the study we define the concept of *res computans* as the subject associated to the living thing. For this, we aim to elaborate an analysis of such activity that we call computing, common to all living entities, which emerges as the subjectivity of the living thing. The *res computans* supposes a connotation of computing not limited to the classical meaning of writing in algorithms but returns to its sense of calculating and pondering. Besides, this concept of computing is also weaved with different ideas, from ontology of the living beings to cognitive sciences.

Finally, given that the Cartesian *cogito* is only reached after getting older and considering Descartes' concern on the longevity of the body, we propose to examine these ideas in Descartes and the present biological view of the aging process in the yeast as an example of *res computans*. Furthermore, we intend to discuss on the result of maturing in Descartes' subject and in the living subject.

Along this line of argument we account that in the living thing takes place the subjectivity, i.e. the computing which allows the living subject relating to its *world* and hence surviving.

2 Cartesian Subject: Relation with the World and with Life

Descartes' philosophy proposes a way to conceive the world strictly linked to the comprehension of the reality through the reason. The author supports that the possibility of realizing the world finds its origin in the *ego cogito*, i.e., in the "thinking thing". The "thinking thing", "a thing that doubts, understands, [conceives], affirms, denies, wills, refuses, that imagines also, and perceives" is assumed as the first principle of philosophy and as the first truth (Descartes 1913/1641, pp. 33–34).

The Cartesian certainty of the *ego cogito* is centered in the recognition of Descartes own thinking. From this moment we localize the notion of the own existence and the ideas that constitute his thoughts, which are contained in the self being and include those ones that are "images of things". Descartes affirms then, and we should note it as a crucial issue, that the ideas contained in the self being are always true insofar as be considered per se and not related to external things: "Now, with respect to ideas, if these are considered only in themselves, and are not referred to any object beyond them, they cannot, properly speaking, be false" (Descartes 1913/1641, p. 45).

In turn, the things, the substances in Descartes are because they possess an attribute, a quality which defines them as themselves and distinguishes one from each other (Descartes 1913/1641, p. 53). We are persuaded that this conception—of being in itself without requiring anything else—separates and immunizes one substance of others and implies a first difficulty when the subject faces the world. Moreover, between the substances introduced by Descartes the *res cogitans* and the

res extensa there is not necessarily a vinculum. The former does not need the latter for knowing. In fact, the *res cogitans* does not require the extension to perceive a body but does require the mind, which also “easily” and “clearly” apprehends itself: “it is now manifest to me that bodies themselves are not properly perceived by the senses nor by the faculty of imagination, but by the intellect alone (...) they are not perceived because they are seen and touched, but only because they are understood [or rightly comprehended by thought]” (Descartes 1913/1641, p. 41). And even more, in the Method, Descartes (1899/1637, p. 36) stresses that the self being, the soul, that is more intelligible than the body, can be what it is without the body: “the mind by which I am what I am, is wholly distinct from the body, and is even more easily known than the latter, and is such, that although the latter were not, it would still continue to be all that it is”.

The clear and distinct ideas take place only in the Cartesian *ego*, so only in the *ego* an idea makes subject and object coincide and, somehow, thinking and reality, mind and extension, and, consequently, no difficulties nor doubts will be perceived and everything will be found in the territory of the soul. Now then, in the transit of the idea from the *cogito* to the exterior reality, that is, in the moment of referring to the world, is when a lack of a dialogic possibility becomes evident. Such necessity of suture finds a solution when the idea of a perfect and infinite substance appears: “the idea by which I conceive a God [sovereign], eternal, infinite, [immutable], all-knowing, all-powerful, and the creator of all things that are out of himself, this, I say, has certainly in it more objective reality than those ideas by which finite substances are represented” (Descartes 1913/1641, pp. 48–49). This idea constitutes the fundamental linkage between the self being and the world. Such a perfect substance is, beyond other means, the Cartesian tool that allows the relation among finite substances. In fact, throughout his Meditations, Descartes affirms repeatedly that this idea of God is the condition that warrants the true perception of all things, for the sake of example: “after I have discovered that God exists, seeing I also at the same time observed that all things depend on him, and that he is no deceiver, and thence inferred that all which I clearly and distinctly perceive is of necessity true” (Descartes 1913/1641, p. 82), or later in the Principles of Philosophy: “at the same time that there is a God upon whom we depend; and after considering his attributes we will be able to investigate the truth of all other things, since God is the cause of them” (Descartes 1913/1644, p. 173).

In addition, in the certainty “*cogito ergo sum*” is produced an omission of a prior evidence. Descartes before knowing himself as a thinking thing knows about he being alive. In fact, this is so undeniable that he establishes the “provisory code of Morals” in order to “live commodiously” during his way to the truth: “I might not be prevented from living thenceforward in the greatest possible felicity” (Descartes 1899/1637, p. 24). We well understand that the Cartesian doubt is what constitutes the thinking subject and gives its existence. This subject is nothing but a spirit, intellect or reason, a thing that truly exists. However, we can add that this thinking thing that, as demonstrated, is different to the extensive thing and is the owner of the subjectivity assuming the evidence of the subjectivity, this thinking thing that is possible to know and live only by the subject of the evidence leaves out the prior truth of its own life. Before reaching the *cogito* Descartes renounced to everything,

he convinced himself that nothing existed in the world, he was even able to suppress the judge and drive the doubt to the *extremis*, however he was not able at all to suppress the actions and suppress his life. *I am a living thing* is, as we infer, the first implicit certainty that Descartes (un)covers, accounting for his living being in relation with the world before the certainty “*je pense, donc je suis*”. We consider, and we would like to precisely elaborate on it here, that this omission takes place due to Descartes’ exclusion of cognition (the Cartesian *cogitatio*) from life. In fact, Descartes supports a mechanistic idea of life associated also to the dual distinction between soul and body. In this sense, he equates the humans with “the animals void of Reason” in all “functions” given by God to the body and separated of the soul, i.e., “that part of us which is distinct from the body, and of which it has been said above that the nature distinctively consists in thinking” (Descartes 1899/1637, pp. 49–50). Therefore, these common attributes of the bodies that all of them have, independently of possessing reason or not, are what he thinks all the living beings possess, as long as living things. In fact, as thoroughly analyzed by Ablondi (1998), these Cartesian principles of life are, nothing more and nothing less than the internal principle of motion, the heat, and the divine complexity that distinguishes God creatures of automata.

Altogether, we can say that the *res cogitans* thinks and is alive as well.

3 Computing in the Living Being: *Res Computans*

In his Objections and Replies, Descartes (1934/1641, p. 53) clearly defines the substance, the *res*, by its property, its quality or attribute, since “a real attribute cannot be an attribute of nothing”. In fact, he affirms: “Everything in which there resides immediately, as in a subject, or by means of which there exists anything that we perceive, i.e., any property, quality, or attribute, of which we have a real idea, is called a Substance”. This *res*, whatever it is, does not need anything but itself, it is per se its own attribute, as he illustrates in the Meditations with an example: “For when I think that a stone is a substance, or a thing capable of existing of itself, and that I am likewise a substance, although I conceive that I am a thinking and non-extended thing, and that the stone, on the contrary, is extended and unconscious, there being thus the greatest diversity between the two concepts,- yet these two ideas seem to have this in common that they both represent substances” (Descartes 1913/1641, p. 53).

Hence, the Cartesian *res cogitans*—that reaches and definitively imprints the notion of subject—is only by what it possesses and it is defined by what it is. At this point, we can propose a necessary turn in this idea of *res* of the *res cogitans*. Returning to our consideration of the omission of the life from the Descartes’ conception of subject, i.e. the *res cogitans*, we propose to become the latter a living *res*. For this operation we also need that this attribute gives action to the *res* and, at the same time, both attribute and substance being reciprocally transformed. For our living *res* this (being alive) is, in fact, its first quality, which is not intrinsic but contains other properties: This living *res* does not live because it lives but because it interacts with the world. If a question defines this *res*, now this is not *what is it?*

but *how does it make to be?* At this moment we can re ask what a subject is. Is it, perhaps, as Cartesianism suggests, what possesses the ability of reflexive consciousness, of self recognition? Well then, it is more than this; a subject is what has the faculty of knowledge and affirmation of the self in relation with the non-self, the other thing (Varela 1978, p. 541). Moreover, we consider that the subject emerges from the self and non-self consciousness as a quality of being inextricably of a living entity. In fact, a living subject is able to know itself as living and, at the same time, as part of the life (Morin 1980, p. 232). In terms of philosophy of mind, Varela (2000, 1991) points that there is no possible cognitive capacity without an associated corporality, imbued in the world. Therefore, cognition is inseparably linked with a living organism as a whole. In other words, by this operation—i.e. discovering a subject within a living entity—we recognize cognitivity in the life.

A conclusive “biogenic” approach to cognition—in opposite to “athropogenic”—has been recently well characterized by joining concepts from “self-organizing complex systems” (von Bertalanffy’ school) and autopoiesis (Maturana and Varela’ school) (Lyon 2006). Interestingly, the author provides an improved idea of knowing. In fact, in Lyon’s (2006) conception to know is to interact in a familiar way with the system (repetition) and adequate to maintain autopoiesis and adaptation. Such autopoietic cognition implies performing an adequate action and its domain changes continuously with the structure of the system and its surroundings. Moreover, the autopoietic system “cannot exist apart of its surrounding media” which is defined by the interactions that an organism can establish with and constitutes its “cognitive reality” (Lyon 2006).

Again, we repeat the question that we have begun: how our living *res* does make to be? And the answer is—said from the outset—*it computes*, the living *res* is and is living because of computing. In other terms, what we do for affirming that *the res computes* is nothing but including this capacity of computing to the capacity of being. As we will see soon, this capacity of computing is a cognitive capacity. We propose that cognition is not an independent faculty but a faculty linked to the information process, separated from the mind but included in the nature. At the same time, and associated to this *res*, the act of computing is not merely cognitive but is indeed subjective. The construction *res computans*, hence, permits us enhancing any cognitivist approach on a living being returning it to a prior metaphysics’ scenario. Therefore, we conceive a living *res* that needs itself and the other things for existing; it is active, individual, different and distinguishable of other substances. This *res* is in the *world* and it manifests dialogically, making a relation in and with the surrounding and transforming it producing the *world*.

That said, we will try to assemble an own meaning of the concept of computing that could integrate different conceptualizations with which we will be able to better outline such a constitutive activity of the living *res* that we are concerned to analyze.

The verb compute proceeds from the Latin and it is appealing to note that the Latin verb *computō* (*com* + *putō*) that means calculate and value also shares a usage with the verb *cogitō*. In fact, *putō* and *cogitō* are synonyms in a sense that signifies consider, ponder and think. Therefore, these Latin terms seem to be closer than their counterparts in English, and despite it is not our aim to study the difference in their original usages, we find suggestive for our construction to think

that the distinction between *computō* and *cogitō* could be just a question of specification or restriction in their scopes.

Interestingly, Morin chooses this verb to point out that computing is a vital activity of the living being, which is a cognitive activity of recognition of self and non-self; computing is, for the author, the basis of the autonomic being of the living being. He adds, as well, that computing allows dealing with the problem of living that is indeed the problem of survival (Morin 1986, p. 51). Maturana and Varela's concept of autopoiesis also involves somehow this idea (Varela et al. 1974). In fact, Varela (1992) establishes that autopoiesis, i.e., the self organization which is common to all living beings, is an ontological attribute of the living being but also is in part a cognitive relation of the living being and its *world*. In this point Varela agrees with Castoriadis (1989) in considering that the surrounding becomes the *world* of the living being by the existence of a kind a dialogue, an *entre deux* that Castoriadis does not hesitate to assume as a matter of creating information from something X in the outside—we will return to this idea later. Castoriadis (1989) postulates that this process of *in-formation* is part of the for-itself of the living being who is the *subject* that creates—since it does not have a previous mean—and *forms* it.

We want to briefly mention here that the above concepts are not far from some assumptions established in the application of the information theory on biological systems and biological complexity. From this perspective, information, which is distinguished from uncertainty or randomness, is always referred to and about something, which constitutes the environment or niche (Adami 2002; Hodgson and Knudsen 2008), in our terms the *world*, i.e., a particular surrounding that is related to (and con-formed with) the subject of information.

Putting it all together we can define computing as the living being's activity of taking information from the environment, and, more precisely, of sensing and giving sense to the surroundings thus producing a *world*. Wherever this activity of computing begins and ends in the living being, it includes taking-knowledge-of something, that is, all the stages in this process of elaboration from perceiving and relating to reacting to something.

In addition, we find that the present notion of computing (an action carried out by a living organism) not also reintroduces the term to its original meaning of considering and pondering which is linked to thinking—as we have shown—, but also has resonance with its utilization in cognitive sciences. Other authors postulate that life can not be a process completely computable in terms of algebrization or simulation (Rosen 1991, Louie 2009), and this has been recently debated in Axiomathes (Gutiérrez et al. 2011). However, if a living system is or not computable, it is independent of being somehow computing *per se*.

Thereby, since the original notion of computation there exist different ideas of what a computing system is, in such a way as a mind could be, that are still in discussion in the computational theory of mind (Piccinini 2007). A computing system can be conceived basically as a Turing machine that computes inputs into outputs, i.e. that draws logic inferences, and this is the way of working of the mind for the pioneers of this theory (McCulloch 1965; Putnam 1960). However, it is also postulated a “semantic view of computation” (Piccinini 2007), in accordance with which a computing system is what can manipulate representations (Peacocke 1999), this view

means that for a mind as a computing system it is not sufficient to draw logic inferences but to previously synthesize and decode representations/concepts. Moreover, Piccinini (2007) proposes a further class of computing system combining the semantic and functional views, i.e. a computing system that not only manipulates representations but also involves some functions or mechanisms of the system. A living thing, a *res computans*, resembles a computing system as the latter class. In fact, such a living thing performs a representational process and put into relation the represented information by engaging particular functions/mechanisms (and structures) of the living system. In Sect. 5 we will see these steps within some *bona fide* examples.

This activity of computing of the living being that we have now finished outlining is what finally constitutes the subjectivity of the living being. Moreover, if computing is essential for the living organization maintaining the identity of all living beings, as supported by Morin (1980, pp. 216–217), we can affirm that subjectivity is not a goal but becomes a condition of the living *res*. In other words, subjectivity is implicit in the living being and defines it, that is, a living being is nothing but a *res computans*.

4 The Mature *Res Cogitans*

We want to pay attention to the fact that before beginning his meditation and facing the truth, Descartes (1913/1641, p. 21) brings up the necessity of coming of age in order to ensure the success of his task: “I waited until I had attained an age so mature”. We wonder what he is referring to when he demands the maturity prior to initiate his work. In principle, we can say that this maturity corresponds with virtue, sincerity and responsibility that are linked to the idea of repetition and reiteration of actions associated to the experience. What we unequivocally note is that Descartes interprets maturity as a quality of the thinking thing. In fact, in the First Meditation Descartes (1913/1641, p. 21) establishes this vinculum between maturity and age when he states that he has “delayed so long” his task for not wasting “on deliberation the time that is left for action”. Interestingly, we find a very similar notion of the maturing of subjectivity in *The Republic* by Plato (1901/380–370 B. C., pp. 237–238), when the importance of getting older is stressed for the dialectic practice, thus young men getting “their experience of life” becoming firm in every action and “in every branch of knowledge”. Hence, after reaching “50 years of age”, they have to “raise the eye of the soul to the universal light which lightens all things”. Given that Platonic dialectic was considered as the Science of Sciences it is quite possible that Descartes coincided in this requirement to access his truth.

Cartesian maturity, insofar a quality of the thinking thing, seems to correspond with a kind of capacity of the soul of sacrificing all its goals, all its knowledge and experiences in order to be able to generate new and better abilities. In this connection, maturity could enable the soul to meet with something different to all known at this moment and, furthermore, to face new necessities. Therefore what does the matured Cartesian subjectivity consist of? One can infer that only from the moment maturity is reached, Descartes’ subject, the *res cogitans*, is able to search in the intimacy, in its own interior trying to take off everything what was previously

obtained from the exterior, for building in such monologic activity of the own self being, clear and distinct ideas. Below, we will attempt to continue this analysis on the maturity in a living subject.

In addition to this idea of maturity of the mind, it is clear that Descartes supports an own idea of the effect of age upon the body. His view, despite of being more medical than biological, is in fact ahead of his time. Beyond mind–body dualism, Descartes gives physiology and fitness (of the body) a paramount importance as demonstrated by his early (but belatedly published) and perhaps incomplete works on human anatomy and functioning, e.g. his *Traité de l'homme*, firstly known as its Latin translation of 1662, *De homine*. Moreover, in diverse letters to friends like Marsenne and Huygens, he points very especially to human aging and his concern about lifespan extension. Probably many of these ideas—and practices—are shared with the Rosicrucians with whom Descartes is apparently linked (Baillet 1693). We can resume these ideas in two key points: First, in the Method he stresses that “the knowledge of the causes” of “an infinity of maladies” and even “the debility of age” would be completely understood through its (scientific) study (Descartes 1899/1637, pp 66–67), to which he is also committed, this leading, sooner or later, to extend human longevity, as he writes to Marsenne: “au moins jusqu’ à ce que je sache s’il y a moyen de trouver une Médecine qui soit fondée en démonstrations infaillibles, qui est ce que je cherche maintenant” (Descartes 1910/1630). And second, Descartes supports, in association to his new philosophy, a new and effective medical practice for prolonging lifespan in which includes conceptions related not only to blood and circulation in accordance with his notion of the human machine (Schäfer 2005), but also to dietetics: He supports that to eat “roots and fruits” instead of fats of animals “prolongs the life of man” (Baillet 1693, pp. 259–260). These two issues strongly suggest that Descartes thinks aging as a mechanism that could be controlled and, even more, as a process somehow linked to metabolism. In fact, after three long centuries it was reported for the first time that caloric restriction extends lifespan in rodents (McCay et al. 1935), which is considered one of the fundamental evidence for the actual biological theory of aging. Interestingly, this hypothesis about Cartesianism and its advanced view on longevity and many other medical issues is carried out by many researchers in history of philosophy and gerontology (Sebba 1972; Shapin 2000; Shapin and Martyn 2000; Schäfer 2005).

Even though the conception of knowledge (*cogito*) for Descartes comes from the *ego* rather than the life, his philosophy exudes such unfinished division. In fact, we can guess a tense but unique convergence between the ideas of getting aged in the thinking thing and in the body.

5 The Aging Yeast and the Maturity in a Living Subject

But what do we talk about when we talk about aging? Far away from being a unique feature of time-dependent effects on human beings, aging is a conserved process observed even in microbial organisms. Many well characterized common hallmarks and mediators of aging are described from yeast to human (Fontana et al. 2010), and strong evidence supports that a proto senescence process is achieved also in bacteria

indicating that an aging program has evolved from prokaryotes to eukaryotes (Książek 2010; Gonidakis et al. 2010).

Yeasts, that are the simplest eukaryotic organisms, live in different ways depending on glucose availability. In fact, upon glucose exhaustion, the cells of the baker's yeast *Saccharomyces cerevisiae*, the most studied budding yeast, that normally ferments glucose with very high metabolic flux, can survive in a non-replicative state a time period defined as chronological longevity. Such survival in stationary phase depends on different genetic changes that lead to specific changes in cell metabolism: increase in respiration, shift to routes for alternative substrates, oxidative-stress response, etc., and this adaptation is achieved by signaling pathways triggered by the scarcity or absence of glucose (Bitterman et al. 2003). Studying the biology of the chronological longevity in yeast and comparing with other models in fly, worm and mouse, it has been understood that the aging process is regulated and conserved from inferior to superior eukaryotes (Piper 2006; Guarente 2008; Kenyon 2011; Fontana et al. 2010). Well defined signaling pathways participate in this process in yeast cells, which include diverse protein kinases. These pathways modulate responses to the presence or absence of nutrients affecting yeast specific target molecules which are, like the mentioned kinases, most of them observed also as lifespan regulators in cells from complex organisms (e.g., transcription factors, heat shock proteins, oxidative stress defenses, chromatin regulators, etc.), hence constituting an ancestral mechanism that regulates cell survival according to changes in fuel availability. Entering in this aging process means undergoing an internal program of cell regulation in which the final time of survival will depend basically on the tolerance to stress that the yeast cell is capable of inducing. Such aging program regulates the extent of cell life and involves the modulation of specific genes and proteins from energetic metabolism to cell death machinery. After a certain period of time most of the yeast cells do not achieve to control the oxidative imbalance and finally die (Herker et al. 2004; Bonawitz et al. 2006; Favre et al. 2008). However, during this chronological aging in the yeasts, a low proportion of cells can survive and, eventually, restore their replicative capacity. Moreover, many researchers on yeast aging support that this is possible because of the altruistic aging of the majority in benefit of the minority by offering their own content to the survivors (Herker et al. 2004) and, most important, by providing a point where selective pressure and success of advantageous mutations can occur (for review, see Longo et al. 2005).

We have described all these mechanisms, although in a simplified fashion, in order to propose the following analytic comparison: There where we had the *res cogitans*, the Cartesian subject, a human subject maturing and experiencing its subjectivity as we have analysed a moment ago, we have here the *res computans*, a living subject as a yeast cell getting aged and also experiencing its computing at this moment, as illustrated in Fig. 1. One can argue that the *in-formation* constructed in the yeast *world* from the nutrient availability (in Castoriadis' words, something *X* put into relation) implies a series of events and intermediaries as signaling kinases, regulated targets, etc. which lead to different responses, i.e., the Castoriadis' *intentions* (Castoriadis 1989). In other words, the whole subjective activity of the yeast cell that we call its computing extends in this example from the sensing of a nutrient to the

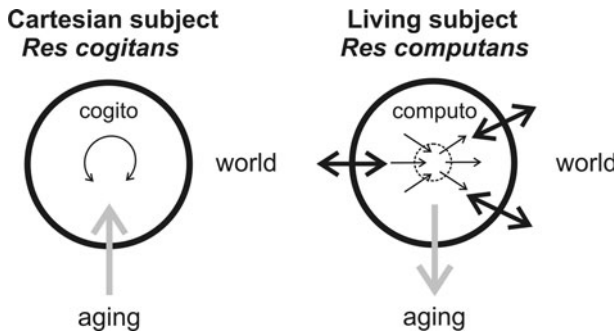


Fig. 1 Subjectivity in the Cartesian subject and in the *res computans*. The circles modelize the analyzed subjects surrounded by the *world*. The conditions that enable the *cogito* become during the maturity of the Cartesian subject (*grey arrow* directed from aging). Subjective activity is represented by *black thin lines*: In the *res cogitans* this consists of a single activity separated from the *world*; in the *res computans* subjectivity is constituted by different signaling and responsive events which are integrated (*dashed line*), this deciding the way of survival. The whole subjective activity of computing is dialogically related to the *world* (*black thick arrows*). Maturity in the *res computans* is a result of properly integrated signal transduction pathways (see the *text*) triggered in response to the environment (*grey arrow* directed toward aging)

actions/reactions which were chosen to perform from such information. And what can we say about the specific nature of this computing during yeast aging, if something distinguishes it from other computing in the yeast cell? We are tempted to say that there is neither singular nor exclusive feature in all these activities included in the computing of the aging yeast (most of the signaling pathways and targets affected that we mentioned above are common to other stress responses) except for an evident turn towards a more conservative or restrictive autonomy (that leads to stop of reproduction, decrease of metabolism, etc.) as a survival strategy, which results at the same time a self and a social strategy. Moreover, we can add that such particularity of the computing during aging, which is different from the computing before entering this life period, likely belongs to the order of the affections of this subjective activity (i.e., the level of assigning a value to something *in-formed*), which Castoriadis (1989) also calls the “*affects of the for-itself*”. What we notice distinctively at this moment of the living being is in fact involved in the *valorization* of the information—after it is represented and put into relation—, which finally guides the actions, the responses observed in the yeast subject at this moment of its life. This fits with the biological view supporting that all the signal transduction pathways involved in this particular condition, many of them being also present in different situations, are integrated in such a way that configures the proper survival response of the yeast cell, leading to slow down its life and to get aged (Fig. 1).

6 Conclusions

We have rethought the notion of subject, introduced an idea of a living *res* different from Cartesian *res* and we defined its action of computing. We refer to a *res* in a non-traditional sense. In fact, the *res* has been normally interpreted from its

attributes: just a thing, there, in some place, with all that it needs for existing and without requiring anything else. On the contrary, here we try to dereify the *res* and hence to end its lying on a solitude of being, we try to give action to its being. This *res* is because of being in relation with others. Moreover, this living *res* is able to perceive and know its surroundings. This *res* is responsible of the informational transit that carries information from and to itself, this is what the *res computans* is. This *res*, the *res computans*, is not just what it is but what it can be at any moment of its survival.

As a result, we expand the notion of subject from the anthropocentric Descartes' subject to a living subject that is able to mature and get aged and hence to deepen in apprehending the *world* through its cognitive capacity of computing. Therefore, we connect cognition and life in the experience of the living being. Life is, then, time and duration of experiencing and also cognition and common existence. We have here a living subject, a *res computans*, a self being in permanent link with the other thing, which is indispensable in the becoming of the oneself of all the living beings.

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