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# Toward a new cosmic consciousness: Psychoeducational aspects of contact with extraterrestrial civilizations $\stackrel{\circ}{\approx}$

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### ABSTRACT

This study presents a new approach to the concept of cosmic consciousness integrated in current neuroscience knowledge and discusses implications for the search for extraterrestrial intelligence. It also examines different aspects related to consciousness and how it may play a key role in the understanding of the search for extraterrestrial intelligence and life in the Universe and its implications. Subjects (n=116) were college students from Spain, the United States, and Italy. Subjects responded to a questionnaire comprising five different sections: (A) religious beliefs, (B) environment and general opinion, (C) astronomy, (D) contact, and (E) attention and perception. The results showed the importance of several modular aspects that affect Space awareness in humans. Preliminary results are discussed with regard to current neuroscience, factor analysis, and possible implications for the understanding of contact with extraterrestrial intelligence. The roles of education, new search strategies, and possible contact scenarios are also discussed.

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### 1. Introduction

On March 2nd, 1972, NASA launched Pioneer X. At the behest of Carl Sagan, Pioneer X carries a gold anodized aluminum plaque intended to provide communication in the event that the spacecraft is ever found by an intelligent extraterrestrial civilization from another planetary system. The plaque depicts the nude figures of a human male and female, along with schemes that are designed to provide information about the origin of the spacecraft and about our nature. In 1984, Jill Tarter and Thomas Pierson founded the SETI Institute, which fundamentally searches for intelligent extraterrestrial radio signals in Space. These are examples of our search efforts for other intelligent beings out there in the vast cosmos. The scientific community now accepts to some degree that this contact may occur in the next 50–100 years; consequently, we are becoming

more concerned about this possibility and its aftermath. Some prominent scientists have expressed concerns about the possible negative effects of this event for the human race [1]. Certainly the topic of contact with extraterrestrial civilizations raises a number of questions that are not easy to answer. The psychological aspects of contact represent an important issue that should be addressed in advance. Neuropsychology, neuroscience, and consciousness theory may have a key role in this endeavor, which we explain in the following pages.

### 1.1. Neuroscience and cosmic consciousness

William James proposed that "taking a purely naturalistic view of the matter, it seems reasonable to suppose that, unless consciousness served some useful purpose, it would not have been superadded to life" [2]. More recently, Popper and Eccles argued that the mind, including consciousness, should be considered to be analogous to a bodily organ and that it is "the product of evolution by natural selection" [3]. In biology, nothing makes sense except in the light of evolution; therefore, in common with





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other biological structures, consciousness exists today because it provided some advantage to our ancestors that was harnessed by natural selection [4]. Humans depend on their own perception and consciousness to interpret and interact with the environment. This subjective scope of reality creates an anthropomorphic view of our world and may lead to errors of perception and consciousness. Over many years, different methods of communication were developed for deaf children so they could learn to communicate with "listeners." The initial problem was that we developed systems based on the listener perspective, and thus had very little success because the larger picture was dismissed, which was communication itself. This is a very typical error we make owing to our nature and biology. Neuroscientists, and especially neuropsychologists, know this phenomenon very well. The Stroop effect is a demonstration of the reaction time on a task. When the name of a color (e.g., "blue," "green," or "red") is printed in a color not denoted by the name (e.g., the word "red" is printed in blue ink instead of red ink), naming the color of the word takes longer, and it is more prone to errors than when the color of the ink matches the name of the color. The effect is named after John Ridley Stroop, who first published the effect in English [5]. The original paper has been one of the most cited papers in the history of experimental psychology. A common explanation for the Stroop effect is that observers have automatized the process of reading. Thus, the color names of the words are always processed very quickly, regardless of the color of the ink. Our brains and minds are prone to process in automatized ways in many circumstances, and much of this happens unconsciously. We have a natural tendency to apply our rules or previous knowledge and derived expectations to our actions and thoughts, and this is the result of natural adaptation and evolution. We continuously look around, searching and seeking of the realms of the unknown, interpreting the surroundings and finding explanations to natural phenomena. All of this information is apprehended by our consciousness in the end. Sometimes, when we do not have a valid explanation for our observations, we decide it could be God's matter, as most religions on earth seem to say, promoting this way to a state of higher consciousness or religious consciousness. This can be considered as an evolutionary step in the development of the human brain. We now know of the importance of the inferior parietal lobe in the creation of consciousness of objects in the external world or held in the imagination. Evidence from neglect (a form of visual agnosia) studies and brain imaging on healthy subjects has implicated the inferior parietal lobe as playing an important role in controlling attention and awareness. The frontal lobes and some subcortical structures such as the amygdala and visual cortex are also implicated in consciousness, but the parietal lobes seem to play the key part in human consciousness [6]. The emotions related to these subcortical structures are described as promoting fast decisions in a brain with slow neural circuitry [7]. The frontal lobes are responsible for executive functions and decision-making, but they are also very important in attention and actions. Although studies do report pop-out effects, that is, gist processing and natural object detection occurring in the

absence of attention, further research has shown that attentional resources are required in each case in order to enable a conscious report of the target stimuli [8]. Indeed, the fact that attention is required for pop-out effects of very simple visual stimuli, such as a colored element or an oriented Gabor patch [9,10], implies that for all conscious events, even those involving very primitive elements, at least some attentional resources are necessary. In addition, a small number of studies have presented provisional evidence that neural dissociations can be found between attention and consciousness [11]. Recent findings in psychology and brain imaging have increasingly suggested that it is better to view attention not as a unitary faculty of the mind but as a complex organ system subserved by multiple interacting neuronal networks in the brain [12]. At least three such attentional networks, for alerting (achieving and maintaining an alert state in preparation for coming stimuli), orienting (selectively focusing on one or a few items out of many candidate ones), and executive control (monitoring and resolving conflicts in planning, decision-making, error detection, and overcoming habitual actions), have been identified. Considerable functional neuroimaging evidence has shown that activities of these networks highly correlate with the essential functions of attention [13,11].

Discovery of extraterrestrial intelligence could have an impact on society and individuals in historically unprecedented ways. Some authors have proposed that colonization examples of the Spanish and British empires offer a good source of information on what happens when two asymmetric cultures meet [14]. We cannot exactly predict what the effects would be if this asymmetry were broader than hundreds, thousands, or hundreds of thousands of years. It has also been previously stated that contact with an extraterrestrial civilization (EC) will not produce any chaos or damage despite the initial impact on society [15]. We estimate that this type of event will have not only a social effect but also on both consciousness and biology as well. Some authors [16] believe that an anthropocentric vision can influence the benevolent or malevolent perception of a possible EC. The variables that produce these misperceptions or interpretation biases with regard to this type of event are related to what we called modular aspects of cosmic consciousness.

More than one hundred years ago, Bucke went further and described a new concept of cosmic consciousness as a new evolution step beyond self-consciousness. According to Bucke, by virtue of self-consciousness, man is not only conscious of trees, rocks, bodies of water, and his own limbs and body, but he also becomes conscious of himself as a distinct entity apart from all the rest of the universe. Further, by means of self-consciousness, man becomes capable of treating his own mental states as objects of consciousness. The prime characteristic of cosmic consciousness is, as its name implies, a consciousness of the cosmos, that is, of the life and order of the universe [17]. Fig. 1 shows a proposed integration model of cosmic consciousness and awareness with current neuroscience.

Recently, quantitative similarities and calculated solutions for the intensities of magnetic fields associated with cerebral function and those that exist within intragalactic and extragalactic Space suggest that the energetic conditions associated



Fig. 1. Cosmic consciousness and awareness model (CS: competitive selection).

with consciousness and its many variants may be more universal than anticipated [18].

## 1.2. Modular aspects of cosmic consciousness and the search for extraterrestrial intelligence

Space, time, denial, and asymmetries between technology and levels of consciousness may play a modular role in the event of contact with an EC. High technological achievement with poor cosmic consciousness in a determined civilization may lead to misunderstanding, oppression, war, confusion, or chaos. A certain level of achievement of cosmic consciousness is needed for successful contact, in our opinion. We do not understand cosmic consciousness as a special mysticstate achievement but as a conscious perception of reality beyond the major effect of the modular aspects (fear, religion, denial, etc.), which is related to attention-intention cognitive-behavioral patterns and mediated to some extent by learning and education. Some individuals, small groups of people or scientists, may actually possess the required level of awareness to be involved in an event such as contact with an EC, but we need to further analyze the current global awareness level as a species.

While Space, time, and technology are physical modular aspects, religion, culture, education, fear and denial are psychosocial and physiological modular aspects affecting cosmic consciousness. To date, Space and time are somehow variables out of our control, and they refer to where Extraterrestrial Intelligence is found and when but also to physical aspect and age of EC. We can presume that a close-contact scenario would not have the same impact as a radio-signaldetection one. Similarly, differences in how old two civilizations are when contact occurs may represent a key aspect in the outcome. Denial is very deeply rooted physiologically and psychologically in our brains. Psychogenic or dissociative amnesia is a good example. In the event of a very stressful or life-threatening episode (abuse, accidents, etc.), people may have difficulty remembering what happened [19]. The mind locks down harmful information, allowing the subject to recover and maintain a much more normal life after the menacing incident. Malfunction of limbic structures, including the amygdala and connections to the prefrontal cortex, are related to this disorder. Stress or fear may affect memory and reasoning. Religion appears to be a detour from self-consciousness to apprehend to some extent a cosmic consciousness. Religion is one of the key aspects conditioning humans' perspective on the nature of EC and the outcome of contact, as some previous studies have shown [16,20,21].

We propose that any EC could take three types of actions regarding contact: (1) avoid contact to prevent asymmetrical negative effects on us, (2) open contact with negative, positive, or unknown effect, and (3) short or long term covert contact with positive, negative, or unknown intentions and outcomes.

Education is an important tool to expand our cosmic consciousness, and it can be intentionally directed to achieve this evolutionary step in preparation for a possible contact event. Today's awareness relies mostly on movies, the Internet, and television, which have given a distorted perception of the universe, ET life, and our place in this universe. One aspect that may help to ease the process in this regard is the discovery of non intelligent life in our solar system or beyond.

In the experimental part of this work, we conducted a pilot screening survey of college students to evaluate possible cosmic consciousness impressions, awareness and knowledge on Space related aspects as well as their opinions on the search of extraterrestrial intelligence and the weight of different modular facets of cosmic consciousness.

Our hypotheses were that (1) religion is one of the main modular aspects, (2) general knowledge among university students on Space science to be significantly poor, (3) environmental concerns to be high, and (4) pseudoscience interest to be higher in those less religious subjects. The main objective of this study was to do a screening for general opinions of university students regarding the search for extraterrestrial intelligence, SETI, active SETI (SETI strategy of sending a message to Space), and the characteristics associated with cosmic consciousness as well as other related domains of interest such as religious beliefs, environmental aspects, and astronomy.

#### 2. Material and methods

In this study, 116 subjects were from the United States (n=13), Italy (n=23), and Spain (n=80). Subjects were all university students from Rome in Italy, Chicago in the United States, and Cadiz in Spain. Although the subjects

continue to participate in the study, preliminary results are presented here, focusing on the Spanish group because it is the most numerous. Descriptive analysis was performed for the total sample, while varimax factorial analysis and correlation analysis was performed with the Spanish sample only. Subjects were between 20 and 40 years of age; 44.80% were female (n=52) and 55.20% were male (n=64). All subjects participated voluntarily and responded using a computerized 5-point Likert-type scale for the different sections, where 1=completely disagree and 5 = completely agree for scales A, B, and D. For each item on these scales, subjects were instructed to select the number that best described their view or opinion. Ouestions were related to five sections or topics; (A) religious beliefs, (B) environmental and general opinion, (C) astronomy, (D) contact, and (E) attention and perception. Scales C and E had the same 5-point Likert-typology, but every point corresponded to a specific response. Participants were assigned identification codes to preserve their anonvmity, and the data obtained were later analyzed using SPSS software for Windows.

### 3. Results

Separate factor analyses were performed for the A, B, D, and E scales only for the Spanish sample (n=80). Factors were transformed using varimax rotation (orthogonal). The largest number of factors that met the standard criterion of having an eigenvalue of > 1.0 was extracted. For each factor, items with a factor loading of less than .40 in absolute value were discarded for further inclusion in corresponding new scales summarizing each factor. Cronbach's α internal consistency analysis results were.842 for A scale (religious beliefs), .655 for B scale (general opinion and environment), .775 for D scale (contact), and .465 for E scale (attention/perception). One single factor was extracted from the 11items assessing A scale, religious beliefs (7 items loading at >.40), explaining more than 45% of the variance. The factor was re-encoded and called the believe in God construct. Three factors were extracted from B scale, general opinion and environment: (1) Global catastrophes and planetary/cosmic influence on humans (4 items at >.40), (2) human effects on the environment (3 items at >.40), and (3) interest in nature (3 items at >.40). Two factors were extracted from the 20 items of the D scale: (1) *life in the universe* (7 items at >.40) and (2) contact with extraterrestrial intelligence (7 items at > .40).

(1) A scale: Religious beliefs

Most of the items in this scale heavily loaded on one single factor (7) that was called *believe in God*:

- The essential core of all religions is the same. (.780)
- I believe in reincarnation. (.869)
- The Bible is inspired by the word of God. (.840)
- I believe that demons and angels exist. (.728)
- I think that God made us in His image and likeness. (.826)
- Spirituality and religion are the same. (.734)
- There is life after death. (.461)

- (2) B scale: General opinion and environment Three factors explaining 23% of the variance were
- identified for this scale with different loadings. (1) *Global catastrophes and planetary/cosmic influence on humans* 
  - A catastrophe of global proportions is imminent. (.741)
  - I believe that now there is a real danger of a great solar storm with devastating effects on earth. (.680)
  - I think that all are united in the cosmos in some way that I cannot explain but I can feel. (.663)
  - I think we all have a destiny in life, and this is governed by intelligent forces that we do not understand. (.586)
- (2) Human effects on the environment
  - The origin of global warming is human activity: excessive release into the atmosphere of gases and pollution. (.663)
  - At the current rate of resources exploitation, we will have serious problems in less than 100 years to survive on the planet. (.518)
  - Our current civilization is more advanced in every aspect than ancient cultures such as the Egyptians or the Mayans. (.613)
- (3) Interest in nature
  - I usually watch documentaries about nature, animals, and/or Space on TV. (.814)
  - I am concerned about nature (forests, animals, etc.) and the measures taken for its preservation. (.626)
  - It is important to have a Space agency and Space research program. (.821)

(4) D scale: Contact

Most of the 12 of the 20 original items grouped in two factors, although three factors were detected, two of them were composed of very similar items, so we grouped them in the same factor called *contact* (6 items). We called the other factor *life in the universe* (6 items).

The remaining eight items allowed subjects to select choices from multiple items.

- (1) Contact
  - The military should have the main role in the event of contact with an alien civilization (.714).
  - If we establish contact with another more advanced alien civilization, they are likely to be friendly (benevolent) (.697).
  - If we establish contact with another more advanced alien civilization, they are likely to be malicious (malevolent), and they will try to conquer or dominate us in the same way we do experiments with animals (.800).
  - SETI's proposal to send a message into Space to possibly be detected by extraterrestrial civilizations is a good idea (.559).
  - In the event of contact with an extraterrestrial civilization, authorities would probably hide all evidence and information from the general public (.422).
  - Humankind is now ready to establish contact with an advanced extraterrestrial civilization (.748).
- (2) *Life in the universe* 
  - Other planets with extraterrestrial life are likely to exist. (.875)

- There is extraterrestrial life on other planets that have a more advanced intelligence than ours (.860).
- Contact with alien civilizations is possible (.872).
- There is a possibility that we have been visited by extraterrestrial civilizations in the past (.780).
- There is a possibility that life exists on other planets or satellites in our solar system (.745).
- UFOs are real phenomena that indicate that beings from other worlds are visiting us today (.704).

In comparison to the other scales of our survey, E scale (*attention/perception*) obtained a low consistency score (.465). This is because of the variability in statements used on this scale. This scale includes attention/concentration items as well as perception items. Nevertheless, one factor was extracted from this scale, the attention/perception factor, with a.670 *Kaiser–Meyer–Olkin* value. This factor explained 38.40% of the variance.

Further bivariate Pearson's correlations were calculated for different comparisons between extracted factors from the different scales. Some significant correlations were obtained, and these are briefly summarized as follows: *Life in the universe* correlated positively with *global catastrophes* and *planetary/cosmic influence on humans* (r=.205; p=.027) and negatively with *human effects on earth* (r=-.266; p=004.) These results can be interpreted from our perspective of cosmic consciousness as a result of subjects believing that cosmic events are out of human control and that human actions have no effect on cosmic levels. Results were also interesting for believe in God with *contact* (r = -.400; p < .001). This clearly indicates that people who are believers in God or religious persons had more difficulty accepting the possibility of contact with extraterrestrial civilizations, although, interestingly, they did not have problems accepting the existence of life beyond in the universe. One more important aspect to note here is that the majority of the Spanish sample declared themselves to be believers and religious. Possible correlations were also calculated for the astronomy scale (C) (correct answers) and the B scale factor interest in nature (r = -.195; p = .036). This shows that despite subjects' interest in nature and environmentalism, their responses did not correlate with their interest in astronomy. This can be explained in light of our theoretical discussion above. Subjects may be conscious of Earth or planetary problems, but that does not necessarily mean they understand how this can be related to more global or cosmic dynamics. This can be because of low levels of knowledge of astronomy or could reflect too strong an anthropocentric perspective as well. Finally, a correlation between contact (D) and attention/perception (E) (r=.271; p.003) was found. This was interesting as well, as we consider the relationship between what people pay attention to and the possibility of opening this attention to a new, more global or ample perspective of reality to be important. Movies have shown different and imaginative

### Table 1

Total descriptive data for section D. Contact.

	Ν	Median	Mode	Mean	SD
1. Other planets with extraterrestrial life are likely to exist	116	4.00	4.00	3.68	1.21
2. There is extraterrestrial life on other planets that have a more advance intelligence than ours	116	3.00	3.00	2.99	1.21
3. Contact with other alien civilizations is possible	116	3.00	3.00	3.17	1.20
4. There is a possibility that life exists on other planets or satellites in our Solar System	116	3.00	4.00	3.14	1.25
5. In the event of with extraterrestrial civilization, authorities would probably hide all evidence and information	116	2.00	1.00	2.61	1.44
to the general public					
6. There is a possibility that we have been visited by extraterrestrial civilizations in the past	116	3.00	2.00	3.12	1.36
7. UFOs are a real phenomenon that explains that beings from other worlds are visiting us today	116	3.00	2.00	2.84	1.32
<ol> <li>SETI proposal to send a message to the Space to be detected by other possible extraterrestrial civilization is a good idea</li> </ol>	116	3.00	3.00	3.00	1.13
9. Contact with other alien civilization posses a danger for humanity	116	3.00	3.00	2.75	1.10
<ol> <li>If we establish contact with another more advanced alien civilization, are they likely to be friendly (benevolent)</li> </ol>	116	3.00	3.00	2.74	.92
11. If we establish contact with another more advanced alien civilization, are they likely to be malicious	116	3.00	3.00	2.85	.98
(malevolent) and they will try to conquer or dominate us in the same way we do experiments with animals					
12. In the event of contact with an advanced extraterrestrial civilization, please indicate the level of impact it would have on society. (1=none; 5=extremely high)	116	5.00	5.00	4.52	.81
13. In the event of finding alien life (non intelligent), please indicate the level of impact it would have on society. (1=none; 5=extremely high)	116	4.00	5.00	3.78	1.19
14. In the event of contact with an advanced extraterrestrial civilization, please indicate the level of impact it would have on religions. (1=none; 5=extremely high)	116	5.00	5.00	4.23	1.07
15. In the event of finding alien life (non intelligent), please indicate the level of impact it would have on religions. (1=none; 5=extremely high)	116	4.00	5.0	3.81	1.25
16. Humankind is now ready to establish contact with an advanced extraterrestrial civilization	116	3.00	3.00	2.99	1.32
17. Contact with another alien civilization would most likely occur by: (1=radio waves 2=mental communication: 3=direct/physical; 4=finding artifacts; 5=all of them are equally possible)	116	2.00	1.00	2.50	1.43
18. The type of interaction that is most likely to be put into practice by an advance extraterrestrial civilization when they would finds us is: (1=open and long lasting; 2=open and sporadic; 3=at a distance; 4=hidden and sporadic physical contact; 5=completely hidden or secret)	116	4.00	5.00	3.41	1.39
<ul> <li>19. If you could decide what type of message should be sent to Space to contact with other alien civilization out there what type of message would you consider more appropriate to send? (1=No message; 2=an SOS;</li> <li>2. splitting approximate the sentence of the sentence of</li></ul>	116	3.00	3.00	3.30	1.22
20. The military should have the main role in the event of a contact with alien civilization	116	3.00	3.00	2.93	1.25

Table 2				
Percentages of correct and	erroneous	answers in	n astronomy	scale (C).

Astronomy	% Correct	% Error
<ol> <li>My knowledge of astronomy, planets, stars and the Cosmos is. (1=very poor; 5=very good)</li> <li>When looking at a starry sky I can recognize the following number of constellations: (1=0; 2=1; 3=2; 4=3; 5≥3)</li> <li>I believe that the speed of light can be surpassed</li> <li>The largest planet in the Solar System is: (1=Mercury; 2=Venus; 3=Mars; 4=Jupiter; 5=Saturn)</li> <li>The nearest spiral galaxy to ours is: (1=The Mikty Way; 2=Andromeda, 3=Orion; 4=Megallan; 5=Rigel)</li> <li>Which of these does not belong to astronomy: (1=Leukocyte; 2=Pulsar; 3=Nebula; 4=supernova; 5=Black Hole)</li> <li>In what year did man first walked on the moon? (1=never; 2=1971; 3=1969; 4=1992; 5=1946)</li> </ol>	7.80 45.70 33.66 69.80 34.50 44.00 81.90	92.20 (*) 54.30(*) 66.44 30.20 65.50 56.00 18.10

<sup>(\*) = &</sup>lt; 2.

scenarios and possibilities of contact, but most of them are very anthropomorphic in essence. We consider that the possibility of real contact implies the development of a wider scope of perception, to some degree beyond the regular framework of logic in terms of physics and psychology. As for the results obtained from subjects from the other two countries (the United States and Italy), the sample size was small, but for reference, we summarized the total exploratory descriptive data for the D scale (contact) for all subjects together (Table 1). In future research, we expect to increase sample sizes for these countries and add subjects from other European countries to the global sample, because we are not only interested in opinions for every country but also global opinion on the topic. Table 2 shows the results for C scale (astronomy) questions about general astronomy. It is interesting to note that only two questions were responded to correctly by the majority of subjects, one being the year when man first walked on the moon (81.90% answered correctly) and the other being the name of the biggest planet in the solar system (69.80% answered correctly). It is interesting to note that more than 90% of subjects considered their knowledge of astronomy to be very poor.

### 4. Discussion

Psychology, neuropsychology, and neuroscience offer good points of reference for the analysis of self-consciousness, cosmic consciousness, and how they may affect our judgment and decision-making in the search for extraterrestrial intelligence and its aftermath. We know that some cognitive processes are fully conscious and others are not, but both determine our behavior and way of thinking.

Consciousness represents a key factor in apprehending reality in many ways; thus, in some cases it constitutes the first step toward grasping more complex realities by allowing awareness to happen. As a higher form of consciousness, cosmic consciousness may represent a key evolutionary step in human cognition. Exploration, through perception and attention–intentions mechanisms, is fundamental to all levels of existence. We explore our world in a perception–action cycle [22]. The development of our cognitive skills and consciousness depend of an appropriate interaction with the complex and changing environment in which we are embedded. Consciousness relates to attention and intention but also to perception [23]. The way we perceive the universe and life affects our consciousness, and this has a significant influence on our perception and consciousness about the search for extraterrestrial intelligence and the possibility of contact with other advanced intelligences. Some authors have postulated that we are prepared to cope with contact as we did with other high-impact or catastrophic events in the past, in part thanks to the technology, communication, and modernity [15].

Other studies with Spanish samples found results opposite to ours regarding attitudes toward the possibility of contact [24], but others did find that religion was an important factor as well [16]. In our opinion, contact depends on access to new awareness milestones. This is necessary so we can properly assimilate the information corresponding to this event or situation. Perception of the different scenarios and possibilities in the search for intelligent life in the universe may promote this awareness or cosmic consciousness. We propose three different types of contact scenarios possible: open, covert, and avoidance. Nowadays, open or manifest contact is the mainly accepted hypothesis, but covert or unconscious contact is another possibility we should not discard. Several obstacles affect perception and consequently consciousness and actions such as concreteness and limitations of self-consciousness, and its modular aspects such as Space-time, denial, fear, etc. Some people can surpass these obstacles and get a wider perception of the universe and the extraterrestrial-intelligence scenario, but for most of the people on our planet that is still difficult to achieve because of the strong effects of the modulators of consciousness. Education, stimulation, and implications of the findings of Space research agencies and organizations are crucial aspects, in our opinion. Our study shows extremely poor levels of knowledge of astronomy among current college students in our sample. Astronomy and Space should be more important topics in current primary, secondary and higher education, as are Earth sciences, History, Economics, Geography, etc. The relationship between consciousness and the universe is not clear, but we suspect it could be greater than we previously thought. Some studies, especially those in quantum physics, are trying to close the gap. Penrose [25,26] proposes that consciousness depends on quantum biological computations, perhaps within or among brain neurons. This quantum activity may result in a moment of conscious awareness and/or choice, and the nature of these quantumgravity processes can be related to the fundamentals of Space-time geometry, so this may suggest a connection

between brain biomolecular processes and the fine-scale structure of the universe [18].

### 5. Conclusions

Our empirical study shows a deficiency of astronomyand Space-related knowledge among subjects of our sample, but we suspect that this is a generalized effect. This effect together with other factors such as religious beliefs and self- and global consciousness levels as a species may represent key modular aspects to higher levels of awareness of our cosmic nature. A possible explanation can be related to the current modus vivendi in our industrialized society. It is interesting to note that the current global communications era does not seem to affect global or cosmic consciousness. On the basis of the results of our study, most transcendent factors for existential concerns continue to be related to religion instead of ecology or cosmology. It is strongly recommended that we try to develop a roadmap for contact that includes education as the most important factor. New SETI efforts should be directed to other possible scenarios and alternative strategies, however we believe active strategy may not yet be an appropriate one. Extensive education outreach and efforts to increase awareness of Space related topics and existent relationships between Cosmos, Earth and life can be extremely helpful. SETI can take an important role in this regard. As Carl Sagan put it, "humans are the stuff of the cosmos examining itself."

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