The Conscious Unit (CU) model

A preliminary outline of a new approach to consciousness

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DOI: 10.33014/issn.2640-5652.1.2.rakover.1

Abstract

The present paper attempts to handle the question how an unconscious mental state (MS) is transformed into a conscious-MS, by developing an outline of a new model, the conscious unit (CU) model. The essential assumption of this model is as follows: In the cognitive system exists an inborn, special linking-mechanism that connects a MS to a CU, i.e., a unit of consciousness (or a stream of such units when represented by the MS is complex). As a result, the individual becomes aware (conscious) of the MS representation. This model was applied successfully to certain empirical observations and to several problems, which were directed toward the higher-order (HO) theories of consciousness [especially the higher-order thought (HOT) theory].

1 Introduction

Explaining consciousness is a core issue that has baffled philosophers and psychologists for decades. There is currently no accepted theoretical solution to this issue and the various existing explanatory attempts are under continuing debate (see Carruthers, 2016; Gennaro, 2004, 2017; MacPhial, 1998; Rakover, 2007; Gulick, 2017). The present paper discusses the following two related sub-questions: what makes a mental state (MS) a conscious-MS? How is an unconscious-MS transformed into conscious-MS?

Before beginning this discussion, I will clarify two important concepts: MS and consciousness. For the present paper a MS is described in the most general way by employing the following delineation of representation. A system T represents a system O, when T's symbols and their relations map certain aspects of O and their relation. A MS can represent either an individual's external world or inner private world. For example, a blue and red parrot can be represented in one's cognitive system by a hypothetical internal symbol (the representation can be pictorial or propositional but it cannot be a tiny bird in one's head), the content of a book, and even a chimera of a male body with a parrot's head singing the aria *Casta Diva* from *Norma* by Bellini (e.g., Goldstein, 2011; Rakover, 1990). These representations mediate between the external world (the stimulus situation) and the individual's response.

Consciousness is a very complex and controversial concept (e.g., Gennaro, 2004, 2017; Gulick, 2017). In comparison, the emotion of fear has, under different conditions, several behavioral expressions (escape, freeze, or attack) (e.g., Rakover, 1975), but except in the extreme case where a patient is not aware of an object that is detected easily by a normal person, no such behavioral response exists for consciousness. For the present paper I will refer to consciousness as it is expressed by the following example. It takes a few seconds to become conscious of the environment in which I exist in, my body's posture, some of my emotions and thoughts that are running through my mind (I am also aware of part of my consciousness) and above all, I am conscious of being alive, i.e., I have the most basic component of consciousness: the aliveness-feel. This feel gives meaning to the representations. In view of this, I propose that what differentiates a human being from a robot is not the human's behavior, which can be imitated by a robot, but the aliveness-feel that a human being experiences but which a robot does not.

Given these clarifications, I will now discuss the above two questions. They have received elaborated answers in higher-order (HO) theories of consciousness which appeal to certain cognitive system ignoring brain neurophysiology. Essentially, these theories are variations on the following basic idea: a MS becomes a conscious-MS when it is related by a higher-order MS. For example, my MS (desire to drink hot tea) becomes conscious-MS when I think about my desire (I become aware of my desire to drink hot tea). Two important theoretical variations of HO theories are these: the higher-order thought (HOT) is based on the idea that higher-order MS is interpreted as a *thought* (e.g., Rosenthal, 2004), whereas the higher-order perception (HOP) interprets higher-order MS as a *perceptual state* (Lycan, 2004). The HO theories have encountered several objections (e.g., Byrne, 1997; Carruthers, 2016; Gennaro, 2004, 2017). Al-

Figure 1: Abbreviations and Nomenclature

MS	mental state
CU	conscious unit
Linkage CU/MS	a connection between a MS and a CU or a stream of CUs when the thing represented by the MS is complex is made by an inborn special cognitive-mechanism
Link-Condition	the CU is linked to a MS when the link-condition is realized in the cognitive system
Connecting-System	the connections among MS, CU and the Link-Condition
Linking-mechanism	an inborn special mechanism that connects a CU to a MS
STM (LTM)	short-term (long-term)-memory
HO (LO) mental state	higher-order (low-order) mental state
HO theories	higher-order theories
HOP theory	higher-order perception theory
HOT theory	higher-order thought theory
Train Ride	the example situation demonstrating the concepts related to the CU

though these theories suggested replies to these objections, the polemics continues. This paper concentrates on HOT because the major part of the dispute targets HOT. The objections to this theory can be understood intuitively, and most of these disagreements can be generalized to other HO theories.

The present paper offers a preliminary CU sketch-model that can propose explanations for certain empirical observations and solutions for some of the objections aimed against HOT. It also sheds new light on the two questions raised above. This CU model is not developed on Marr's (1982) realization (neurophysiological) level or the algorithm level, but rather on the functional level. On this level, the model is characterized in terms of its goals; how the model operates (e.g., the stages in the information processing); and the rationale and justification on which it is based.

The CU model is developed primarily as an explanation for the following core empirical observation, called the "**Train Ride**": David traveled from town A to town B by a train. He sat in his compartment and thought about the goals of his travel requiring him to get off the train at B-station and meet the secretary of Dr. Arnold, Miss Smith, who offered him a new job (this thought is called The Goal). The journey took about two hours and during that time David focused on a detective novel he was reading, and ignored The Goal. At B-station David got off the train, thought about The Goal, and was also aware that he was thinking of The Goal. He was happy to see a Lady holding a banner on which his name was written and immediately realized that she must be Miss Smith, the secretary of Dr. Arnold.

To explain the behavior of David on the Train Ride the present CU model attempts to answer the following questions: what makes The Goal conscious (i.e., the MS (The Goal) conscious)? How is the unconscious The Goal transformed into a conscious one at the end of the journey? And how was it possible for David to be aware of his awareness?

In the next section the UC sketch-model is presented and the core observation is accounted for. Then it will examine if it can tackle several objections presented to the HOT. If it can provide simple and straightforward answers to several problems with the HOT, this will support the suggestion that the CU model is worthwhile. Finally, the advantages vs. disadvantages and the model justifications will be discussed by describing the fundamental reasons and considerations motivating the development of the CU model.

Figure 2: Notation for Representing Mental States and Consciousness

MS(cat)	a mental state representing a cat
CU/MS(cat)	a CU linked to the MS representing a cat
MS*[CU/MS(cat)]	the CU/MS(cat) is represented by a different symbol or by a different representing state called MS*(MS # MS*)
CU/MS*[CU/MS(cat)]	since the new MS*[CU/MS(cat)] is in the Link-Condition, a CU is linked to MS*[CU/MS(cat)], i.e., CU/MS*[CU/MS(cat)]

2 The Conscious Unit (CU) model: A preliminary sketch

The CU model is based on several assumptions which should be viewed as theoretical statements evaluated in terms of the degree of success in proposing sound explanations for different observations, and also to respond to certain objections raised against other consciousness theories (HOT). No theory that describes how brain activity can be transformed into the processes of consciousness exists (e.g., Chalmers, 2007). Furthermore, I have no knowledge of any association between certain neurophysiological activity in the brain and what I term the conscious unit. The CU model is based on purely theoretical concepts and can be evaluated in terms of its explanatory usefulness.

Assumption (1). The conscious unit (CU). The individual becomes conscious (aware) of the content represented by a MS in the following way. There is an inborn special cognitive linking-mechanism that connects to a MS a unit of consciousness (CU) or a stream of CUs when the content represented by the MS is complex, called "linkage CU/MS". That is, when the linkage CU/MS is activated, the individual enters the state of being conscious of the thing represented by the MS. One possible interpretation of CU is as follows. CU may be viewed as the rudimentary aliveness-feel. When this unit or a stream of units are linked to a MS, the thing represented by it becomes conscious and meaningful.

Assumption (2). The Link-Condition. The CU is linked to a MS when a certain condition is realized in the cognitive system called the "Link-Condition". Five sub-assumptions construct the connections among MS, CU and the Link-Condition called the "Connecting-System":

(a) the CU can be linked to MS only when the MS enters, or is in the Link-Condition;

(b) the CU cannot be linked to a MS more than once. (Without this sub-assumption the same MS can be bestowed with CU infinitely.)

(c) when the Link-Condition ceases, the CU previously linked to MS is now removed from that MS and it becomes unconscious (a re-entrance of that MS to the Link-Condition re-grants it CU)[1];

(d) The linking of CU to MS or its removal from MS is automatic, unconscious and a very fast cognitive operation;

(e) at a given time, the Link-Condition can encompass a limited number of MSs. [Usually one MS (e.g., a thought, an image, a view) at a time.]

Assumption (3). The entrance of a new-MS to the Link-Condition. This situation is associated with three possibilities:

(a) The new-MS acquires a CU. Thus the individual becomes conscious (aware) of what is represented by that MS;

(b) Since the Link-Condition encompasses a limited number of MSs, the previous CU/MS makes room for the new-MS and loses its CU. Thus the individual ceases to be aware of the previous MS;

(c) If the new-MS supplements the information of the previous CU/MS, both the new and the previous MSs are linked to CUs. Thus the individual becomes conscious of both MSs as parts of a whole picture.

Here are two examples. First, I see a white-house in front of me (I am aware of the white-house). I turn around and see a black cat (I am now aware of the black cat). I do not continue to be conscious of the white-house but only of the black cat. (Usually, in daily life, I do not experience an afterimage. Furthermore, I do not develop the belief that the white-house disappears, since when I turn

[1] Can assumption 2c be gradual? Theoretically the answer can be yes, but for the sake of simplicity the Link-Condition is dichotomized. Furthermore, this assumption fits the fact that one is conscious of object A but when one turns the head she instantly becomes conscious of object B and not of A.

around I see the house again and also I have the memory of seeing this house before.). The CU is removed from the MS (white-house) and it is transformed into an unconscious MS. Secondly, I see a person before me, who says "What's up my dear friend?" After a second I become aware that this is my good buddy from the army whom I haven't seen for many years, and I respond "Hey Dan, it's good to see you, how are you?" In this second case the conscious information about Dan's identity (good buddy) is added to the information about the person I see in front of me, i.e., it supplements the conscious information about that person.

Assumption (4). CU simplicity and MS complexity. The CU is a uniform rudimentary unit. However, conscious awareness changes in quality and degree as a result of changes in the thing represented by the MS. For example, one's consciousness of a cat is different from one's consciousness of a dog; and one's degree of awareness of the center of a landscape picture is higher than of one's awareness of the picture's margins. A CU can be linked to a MS composed of one salient element (e.g., a black spot on a white wall) or of many elements (e.g., landscape). In the latter case, a CU is linked to each element of the landscape view in a way similar to a stream of electrons running through the TV screen to build an entire picture. Furthermore, one may affect the thing represented by a MS (e.g., landscape) by several simple manipulations, such as narrowing eyes, staring, and concentrate one's attention.

Assumption (5). Competition between external and internal MSs. When two MSs, one from the external world and one from the individual's inner world, enter the Link-Condition, only the external MS is linked with CU. However, certain manipulations can change or block this linkage. For example, if I see a cat and, at the same time, the face of a movie star is retrieved from my Long-Term Memory, only the cat is linked to CU. However, if I stare (have a glazed look) or close my eyes and concentrate on the appropriate retrieved memory, I can consciously remember the movie star's face.

Assumption (6) Awareness of consciousness. One can be aware of one's consciousness in the following way, as illustrated by an example. I consciously see a cat, i.e., my MS(cat) is linked to CU [i.e., CU/MS(cat)]. I can be aware of being conscious of a cat (according to sub-assumption (2b) a MS cannot grant a CU more than once) if the CU/MS(cat) is represented by a different symbol or by a different representing state called MS*, i.e., MS*[CU/MS(cat)]. Since MS*[CU/MS(cat)] is in the Link-Condition, a CU is linked to MS*[CU/MS(cat)], i.e., CU/MS*[CU/MS(cat)]. This means that I am aware of being conscious of a cat. This situation of being aware of awareness can be achieved by concentrating my inner attention on the CU/MS(cat). Usually, one becomes aware of seeing a cat by 1) concentrating attention on being aware of the cat, 2) by using a language to represent this event, e.g., by thinking: I am aware that I am consciously seeing a cat.

Given the description of the CU sketch-model, I shall attempt (a) to interpret David's behavior in the Train Ride in terms of the model and (b) to show that the CU model may suggest simple and straightforward explanations for some of the objections to the HOT.

2.1 The Train Ride

According to assumptions (1), (2) and also (4) (since the present observation deals with complex MSs) one may understand that David becomes conscious of The Goal (he has to get off the train at B-station and meet Miss Smith, the secretary of Dr. Arnold who has offered him a new job), since this thought was in the Link-Condition and the CU has been attached to it. That is, the Connecting-System has been activated. (Note that the sketch-model does not provide an explanation of how the Connecting-System has been executed by specifying the appropriate mechanisms. It is a description on the functional level. As mentioned no theory exists that details the connection between the neurophysiological activity of the brain and this specific processes of the mind.) These assumptions and assumption (3) may account for the fact that David is not conscious of The Goal while traveling in the train, since he is aware of the novel's new information and The Goal makes room for the new information. When the train stops at B-station The Goal re-enters the Link-Condition and it is re-granted CU (see assumption 2c). The end of the Train Ride is as follows: "At B-station David thought about The Goal, got off the train and was thinking that he was thinking of The Goal. He was happy to see a Lady holding a banner on which his name was written and he immediately thought that she must be Miss Smith." The situation in which David is aware of his awareness can be handled by assumption (6) and the fact he believes that the woman with the banner is Miss Smith can be treated by assumptions (3), (4) and (5), which deal with new vs. old MSs and the relation between external (the lady with the banner) and internal information (the stored information about Miss Smith).

2.2 Objections to the HOT

In this section I present several interesting objections presented to HOT and show how the CU sketch-model can effectively cope with them. These disagreements are still in dispute (for other disagreements see Byrne, 1997; Car-

ruthers, 2016; Gennaro, 2004, 2017). Note that my intention is not to critically survey these objections, but to emphasize that, because of the straightforwardness of the present model's explanations, it may be perceived as receiving methodological support.

(1) Logical problems: Since a MS becomes a conscious-MS by its relation to a higher-order thought (HOT), a question arises: how has HOT itself become a conscious-MS? This question leads to an infinite regress. When HOT is conscious, the problem of circularity arises since consciousness is explained by the fact that one is conscious. A possible reply is to suggest that HOT *is* unconscious. Unfortunately, however, the assumption about unconsciousness raises other problems, which I do not see how they can be solved. It has been proposed that when two unconscious-MSs are related [the HO mental-state is related to a lower-order (LO) one] the LO mental state becomes conscious (e.g., Gennaro, 2004, 2017). Given this, and the reasonable hypothesis that there is a huge amount of unconscious-MSs, one may wonder how it is that one's mind is not flooded with conscious-MSs caused by random relations among these unconscious-MSs. Furthermore, if one accepts that a conscious-MS is not created randomly, then one has to develop a very sophisticated unconscious mechanism which matches two relevant unconscious-MSs (one of them HO and the other LO) without any inner conscious guidance. In my view, this is difficult, if not impossible, to achieve.

By contrast, the CU sketch-model is not bothered by these objections because the linking of the CU to a MS is carried out by an inborn automatic process, the activation of the Connecting-System. Hence no need exists to attempt to avoid infinite regress and circularity.

The Connecting-System (especially sub-assumption 2e) has certain similarities to the well-known metaphors of short-term-memory (STM), the inner visual spotlight, and Dennett's (1991) Cartesian theater. The major focus of these metaphors is to deal with the fact that a limited amount of information can be encompassed in consciousness. While the two first metaphors are anchored to experimental results (e.g., free recall in the case of STM and the distribution of spatial attention in the case of the visual spotlight) Dennett's Cartesian theater is a sarcastic concept used to point out the fact that in the end, the explanation of conscious perception is based on a homunculus who sits in a tiny theater in the head and consciously watches what is staged there.

Nevertheless, the present model is different from these metaphors because it is essentially founded on a functional process. First, the CU sketch-model does not locate the Link-Condition anywhere in the mind/brain – it is delineated theoretically; secondly, as mentioned above, the model does not attempt to suggest a theory of how consciousness emerges from the neurophysiology of the brain – it assumes that a rudimentary innate CU is linked to a MS under a certain condition, the Link-Condition. Note that the assumption about CU can be viewed as a necessary condition for conferring consciousness, since only when a MS is in the Link-Condition is it attached to the CU.

(2) Necessary and sufficient conditions: These objections suggest that HOT is not a necessary or a sufficient condition for phenomenal consciousness. It is unnecessary, since phenomenal consciousness can occur without high-order thoughts; it is not sufficient, since high-order thoughts can, and does, occur without phenomenal consciousness. [Note that "phenomenal consciousness" is referred to in the literature by similar expressions such as "qualitative property of consciousness," "qualia," "what it is like" (e.g., Nagel, 1974), "hard problem of consciousness" (e.g., Chalmers, 1996).]

Necessary condition – Animal consciousness: Today many animal behavior researchers agree that at least the "supreme" animals (e.g., apes, dogs, cats, dolphins, etc.) have phenomenal consciousness, meaning they are conscious of the information detected by their senses (e.g., seeing, hearing, touching) and their emotions (e.g., pain, fear, pleasure by tickling) (see Allen and Trestman, 2016; Rakover, 2007; Seager, 2004). The problem for HOT is that these MSs have to be enhanced with consciousness by HOTs, but there are major doubts whether animals (also infants) possess such advanced higher-order MSs. How one can explain the consciousness attributed to animals without having HOTs has sparked a hot dispute. What I would like to do here is not critically review this controversy, but show that the CU sketch-model can handle this problem quite straightforwardly.

Since it is assumed that CU is rudimentary, uniform and innate, in accordance with the evolution theory one may suggest that the Connecting-System can be found also in animals' cognitive systems, hence these animals may have consciousness (e.g., Rakover, 2007). But, as mentioned, it is doubtful that animals possess the ability of self-consciousness or of being aware of awareness. For example, continuing debate exists whether Gallup's Mirror Test can provide unequivocal experimental results that indicate self-recognition in animals (e.g., a chimpanzee recognizes itself in the mirror) (see e.g. Allen and Trestman, 2016; Gallup, Jr., 1998; Povinelli, 1998). According to the CU sketch-model [assumption (6)], to be aware of awareness another system for representing the CU/MS is required. While empirical observations indicate emotions and sensory informa-

tion are conscious in animals, it is difficult to find experimental evidence that support the hypothesis that animals can be aware of their awareness. While a human can use his/her natural language to represent a CU/MS, a similar language has not been found in animals.

Sufficient condition – phenomenal consciousness: According to HOT, the HO mental state relates to the LO mental state and thereby the LO mental state acquires the qualitative property of consciousness. This raises the following problem: How can HOT handle the possibility that one thinks that one now sees a red flour when in fact one sees a white wall? The HOT may find this question hard to deal with, perhaps because the question is anchored to the request to give a complete explanation of how consciousness is generated, whereas HOT aims only to explain how an unconscious-MS becomes a conscious one.

The present model deals with this question in two parts. In the first one the present model does not provide an answer how consciousness arises from the neurophysiology of the brain. The present answer is similar to HOT's answer. But the second part of the answer emphasizes that the CU model presents some new and interesting information regarding the question how an unconscious-MS is transformed into a conscious one. This helps the present model skip over some of the potholes into which the HOT has stumbled.

First, while according to HOT consciousness depends on the relationship between two mental states (HO and LO), according to the present model the relationship between CU and MS depends on the Connecting-System. Given this, it doesn't matter what kind of MS is at issue (HO or LO mental states) since the same CU is linked to any MS when the Link-Condition is realized. According to the CU sketch-model, the difference between a HO and LO mental states lies not in the conscious experience itself (since the same CU is linked to any MS) but in the content, in what is represented by these two different MSs.

Secondly, it seems that there is a point of similarity between HOT and the present model, assumption (6). But this is only a seeming similarity. The situation "I am thinking that I am conscious of that beautiful cat" is not interpreted as illustrating that I am conscious of the beautiful cat since this MS was related by a higher-order thought; instead, according to the present model, it is interpreted as a CU/MS that was represented by MS* that was linked to a CU.

3 Disadvantages vs. advantages and the CU Model Justifications

Disadvantages: As mentioned above, the present model does not provide an explanation of how consciousness arises from the neurophysiology of the brain. Nor does it provide a neurophysiological explanatory foundation for CU and Link-Condition. As stated, the best way to conceive these assumptions is as theoretical statements which provide us with efficient explanations. The CU sketch-model was constructed on the functional level by a description of how it has to operate.

Advantages: First, as can be seen from the above, the CU sketch-model has succeeded in explaining certain empirical observations and also several objections leveled at HOT.

Secondly, the CU sketch-model is based on six basic assumptions that raise several important questions regarding their rationales. The answers to these questions will highlight the qualities of the present model. I will now deal with the following fundamental queries.

Question (1): Why is the transformation of an unconscious-MS into a conscious-MS done by linking a CU to a MS?

The answer is based on the assumption that the linking-mechanism (see assumption (1)) bestows consciousness on each MS. The bestowal of consciousness depends on the realization of a specific condition (the Link-Condition) in the cognitive system. This bestowal can be achieved in the following two possible ways.

First, the linking-mechanism bestows on a MS consciousness that varies in quality and intensity. The change in conscious experience is matched to the complexity in quality and intensity of what is represented by that MS.

Secondly, the linking-mechanism bestows on each MS the same unit of consciousness (CU). If so, how does the model explain the changes in the conscious experience? The changes do not originate from consciousness itself but from the changes in the content (quality and degree) represented by a MS.

Given these two options, the second was chosen as the infrastructure for the present model for the following reasons.

Simplicity. To develop a theory that will match variations in consciousness to variations in the thing represented by a MS is more complex than constructing a theory that links each MS with the same CU (when the changes in conscious experience are determined by the complexity of the repre-

sented).

Consciousness uniformity. Since the same CU is linked to any MS, the thing represented by that MS is unified to a higher degree in this case than in the case where various qualities and degrees of consciousness are linked to that MS. The reason is that the same CU creates in the perceiver's mind a uniform conscious-feel of the thing represented by that MS (e.g., one perceives a whole picture of a landscape which includes a house, trees, a lake, ducks and birds).

Generalization. Since the second option paves the way for the development of a possible durable linking-mechanism for consciousness grant, one may propose the following. According to the evolutionary approach, it possible to suggest that supreme animals may also possess the Connecting-System, and therefore have phenomenal consciousness. According to the present model, this proposal rests on animals also having the ability to represent the world, i.e., they have MSs which can be linked to a CU.

Aliveness-feel. It is simpler to interpret a CU as an aliveness-feel than a complex consciousness that varies over the dimensions of quality and degree (intensity). Furthermore, this interpretation can be generalized to animals and one may propose that the crucial difference between an animal and a machine is, while an animal can be endowed with an aliveness-feel a machine cannot.

Question (2): Why assume the Link-Condition?

If the CU sketch-model consisted only of the linking-mechanism (without the Link-Condition) one would not be able to explain the following objections: first, the same MS can be conscious at one moment and unconscious at another; secondly, if the activation of the linking-mechanism were non-stop (since the Link-Condition does not exist) the result would be that the cognitive system would be flooded with conscious MSs.

The condition of the Link-Condition provides appropriate answers to these objections: it explains both the linkage to MS and the removal of a CU from that MS by restricting these operations to the cases where MS enters the Link-Condition and where the MS is not under that condition.

Question (3): Why does the Link-Condition handle only a limited number of MSs?

The Link-Condition is a theoretical construct which allows the linking-mechanism to join a CU to a MS. In a given time, it can handle a limited number of MSs. This restriction is based on the following observations and experimental results.

First, if the Link-Condition allowed the linkage of CU to many MSs, one's mind would be flooded with many CU/MSs that would interfere with conducting appropriate behavior, and one's chances of survival would plummet. This is called information overload.

Secondly, many instances indicate that one can be aware of limited visual information. Consider the following case. I am aware of all the items that appear in visual field A. When I turn my head I am aware of all the items in visual field B but no longer of those in visual field A. In this case, the domain of consciousness is restricted: it can encompass only what is represented by MS (field A) or MS (field B). However, according to assumption (3), if I see a face in front of me, I am conscious of the following MSs: I am aware of that face; I am also aware that I saw this face in the past, and that I cannot remember the name of the face's owner. That is, in this case different CU/MSs are joined together to form a unified conscious picture.

Thirdly, the present restriction may be viewed as analogous to the well-known hypothesis that the short-term memory (STM) can handle limited chunks of information (about four). Although there are several criticisms of the distinction between the STM and long-term memory (LTM), most researchers accept that the STM is limited in capacity and can preserve information for about 20 seconds. By contrast, the LTM stores an infinite amount of information for many years (see Sternberg, 2009). Despite this similarity, it is important to emphasize the following crucial difference. While the STM is conceived metaphorically as a storage with limited space, the Link-Condition is a theoretical construct, which can be viewed as part of the cognitive system, and its function is to allow the CU linking to a MS. (Note that as a storage, the STM is not granted cognitive operations; these are bestowed on the "working memory.")

Question (4): When two MSs (one representing the external world and the other one's internal world) enter the Link-Condition, why is the CU linked to the external MS and not to the internal MS?

If the external MS were not preferred to the internal MS, the following intolerable possible situation would be created in the cognitive system: the mind would be flooded with a huge number of internal unconscious-MSs that immediately would be transformed into conscious ones. The assumption regarding the preference of the external over the internal MS prevents the occurrence of this undesirable possibility, simply because a live creature receives continuously external stimulations that are represented in the cognitive system by their appropriate MSs. If the external stimulation was reduced or blocked, as in the case with the experiments in "sensory deprivation," the chances of unconscious-MS ap-

pearing in the Link-Condition and being transformed into conscious-MS would increase. And indeed, the results of experiments in sensory deprivation in which the sensory stimulation of seeing, hearing, touching, etc. is reduced or blocked show detrimental effects such as visual hallucinations, disorientation in time and space, inability to concentrate and think clearly, and restless behavior (see Zubek, 1969).

In light of the above, one may propose that, although the present paper has not offered a theory of consciousness anchored to the neurophysiological level, but only to the functional level, the CU sketch-model has succeeded in explaining particular empirical observations and also in solving certain problems connected with other theories.

Acknowledgements

I am grateful to Jonathan Bartlett and two anonymous reviewers who read the paper and made helpful suggestions.

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