

# Re: General Problem Solving and Consciousness

**Source:** <http://sci.tech-archive.net/Archive/sci.cognitive/2004-08/0089.html>

---

**From:** Eray Ozkural exa ([erayo\\_at\\_bilkent.edu.tr](mailto:erayo_at_bilkent.edu.tr))

**Date:** 08/03/04

Date: 3 Aug 2004 09:14:07 -0700

"Sergio Navega" <[snavega@intelliwise.com](mailto:snavega@intelliwise.com)> wrote in message  
news:<410a5300\_7@news.athenaneews.com>...  
> *"Eray Ozkural exa" <erayo@bilkent.edu.tr> escreveu na mensagem*  
> *news:fa69ae35.0407300434.796653c8@posting.google.com...*  
> > *However, a physicist friend made a nice comment about consciousness,*  
> > *and it's a common sense one. He said something similar to "I don't see*  
> > *how a very intelligent being couldn't be conscious", suggesting that*  
> > *consciousness is just our way of categorizing higher level*  
> > *intelligence, and also that sentience follows all the way up from*  
> > *mindless things to conscious beings. [\*] In effect, he suggested that*  
> > *a theory of intelligence would necessarily explain consciousness, and*  
> > *vica versa. Many people oppose this idea, because it seems to prevent*  
> > *us from breaking down the problem in manageable pieces.*  
> >  
>  
> *To the question your friend posed I would answer yes, I can think*  
> *of a very intelligent being without it being conscious. Of course,*  
> *it all boils down to what one means by "very intelligent being".*  
> *And this is related to the possibility of having very intelligent*  
> *artifacts "living" in environments different than our world. For*  
> *instance, an "intelligent being" linked to sensory inputs that*  
> *translate some kind of information from routers and bridges*  
> *from the internet could present intelligent behavior (in that*  
> *environment). It wouldn't be conscious (at least in the way we*  
> *usually understand this word), but it may learn with experience,*  
> *develop strategies, concoct rules and act on that environment.*  
> *Something like that may even be useful to us.*

Hmm... Do you remember SKYNET in Terminator? :)

I think we do not yet know whether general intelligence would necessarily result in consciousness. Intuition says affirmative, however, as I have suggested on other threads, consciousness is a group of several functions, rather than one specific function. Marvin Minsky has an incomplete list of these functions which we deem as conscious in Chapter 4, Section 4.2 of TEM: (draft URI)  
<http://web.media.mit.edu/~minsky/E4/eb4.html>

Anxiety, Planning, Reactivity, Quality, Identification, Attention, Irresolution, Expectation, Imagining, Meta-Decision, Decision, Recollection, Reasoning, Reflection, Self-Reflection, Embodiment, Emotion, Representation, Expression, Narrative, Intention, Moral Reflection, Self-Imaging, Empathy, Sense of Identity

Let's take Planning for instance. One can envision a Planning entity that lacks Sense of Identity and Moral Reflection or Emotion. Say, like a military robot that acquires targets, constructs a plan and executes it.

However, I doubt we could view such an entity as conscious, perhaps we require at least all of the above functions to exist.

Looking for commonality in the above list is an interesting exercise, for instance, in evaluating the following claim.

(C1) Among the functional components of consciousness, there is little intersection, in particular there is no generative unit of consciousness.

> > *So, let's question: does general problem solving require consciousness*  
> > *or not?*

>

> *I would answer that it doesn't require consciousness. However,*  
> *one can think about some categories of problems that involves the*  
> *perception of one's own body in relation to the surrounding*  
> *environment. Then I would say that a sufficiently intelligent*  
> *being in such an environment may be conscious, but that will be*  
> *an emergent property, not something we will have to "manually*  
> *program into the system".*

I understand. However, I think there are more abstract varieties of self-monitoring. The most important of these, which I tried to emphasize on this group and in my reviews to Professor Minsky, are the computational ones: time/space/program size. A problem solver would be interested in generating strategies that are efficient in computation, communication and storage. [\*]

(C2) I think, the most abstract of these properties can be actually programmed into the system (such as attempted in ADATE)

I also think that work in general problem solving (such as the work by Newell and Simon's and several others in the old days), did have consciousness in some of the above respects. But I cannot imagine: could we add the missing functions, and call the resulting entity conscious? I doubt that is somewhat like patchwork. (Of course, there is an argument that the mind is necessarily a patchwork, that's certainly possible. It's what evolution builds. It doesn't have to be neat in the theoretical sense.)

Regards,

--

Eray Ozkural

[\*] This is more abstract than measurement of physical condition.