

40th SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The  
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# UNIVERSALS IN THE UNIVERSE?

## Abstract

By utilizing and comparing different philosophical approaches, this paper addresses the issue whether communication between aliens and humans are feasible.

Communication with aliens is possible only if at least some things are common. Aliens' bodies may not be carbon based but say silicon. Alien brains may function very differently. Convergent evolution however shows that similar organic structures like the eye can evolve independently from each other in unrelated different species. Why not something similar elsewhere in the universe?

Exact mathematics and logic is perhaps the first place to search for something common. For Lakoff validity and the truth of theorems are shaped by our bodily experience. They are not transcendent, but empirical. Embodied mathematics' concepts are realized by our innate neuronal wiring. Universals are limited to humans. This more anthropocentric approach render communication with aliens rather unlikely.

The idealist and neo-Kantian sees mathematical truths and others as transcendental, but real, existing objectively, independent and so transcending the physiology of both humans and aliens.

According to Marvin Minsky aliens will be quite intelligible. We and aliens are constrained by the same ultimate limitations of space, time and matter. Inevitably aliens must develop symbol systems for referring to objects, causality and goals. The concept of a thing is indispensable for managing resources. Likewise the concept of a goal for managing what we do and think. These notions would be used by aliens too because there appear to be no easily evolved alternatives for them. Minsky allows for the apriori to evolve. This universal apriori can be seen when trying to create new numerical systems: If we skip some number like 4, it just won't work. We must decide what is 2 plus 2. If you say 5, then 5 will have to be an even number and so 7, 9. And what about 5 +5? Should it be 8, 9 or 10?

Mathematics and logic (and all thought) are indeed linked to the brain, but not in a one-to-one relationship with a particular brain state or base like carbon or silicon. Emergent consciousness from neuronal activity, do not rule out transcendental universal structures. Different alien brain stuff could well sustain the same logic, mathematics, physics and chemistry. It could sustain a functional economy of internal sets whose mutual relationships parallel and match perfectly with the mutual relationships that define our human mental sets.