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**From:** jeffrey E. <jeevacation@gmail.com>  
**Sent:** Wednesday, November 9, 2016 7:28 PM  
**To:** Nowak, Martin A.  
**Subject:** Re: ramblings but interesting mathematics.

Yes

On Wednesday, 9 November 2016, Nowak, Martin =. <[REDACTED]> wrote:  
<mailto:[REDACTED]>

can we talk?

Begin forwarded message:

From: Seth Lloyd <[REDACTED] <javascript:\_e(%7B%7D,'cvm=',[REDACTED]);> >=br>  
Subject: Re: ramblings but interesting mathematics.

Date: November 6, 2016 at 3:48:50 PM EST

To: "jeffrey E." <jeevacation@gmail.com <javascript:\_e(%7B%7D,'cvm','jeevacation@gmail.com');> >

Cc: "Nowak, Martin" <[REDACTED]>  
<javascript:\_e(%7B%7D,'cvm','[REDACTED]);> >

Reply-To: [REDACTED] <javascript:\_e(%7B%7D,'cvm','[REDACTED]);>

Dear Jeffrey,

information  
travels  
In both classical and quantum mechanics, there are descriptions of what happens that involve  
propagating backwards in time: they are equivalent to the ordinary descriptions in which information  
travels  
forward in time.

between  
experience  
Our experience of the present moment can be thought of as our neurons jumping back and forth  
the sensations just received and those immediately anticipated, as in our previous discussion of the  
of walking.

oneself  
As we discussed, self awareness is a tricky concept. I like your using this term instead of consciousness.  
After all, 90% of people are unconscious 90% of the time, and the remaining 10% are unconscious 100%  
of the time. The ability to refer to oneself, to remember one's actions in the past, and to imagine

undergoing acting in the future seems to be a pretty powerful ability, and could be quite useful in someone the constant threat of natural selection.

of Similarly, the ability to represent oneself to another self-aware being opens up the possibility of forms cooperation and collaboration that are not available to those aware neither of self or of others. Note that self awareness is bound up in human language, in particular the fully recursive, self-referential type of language that Noam picks out as the essential driving engine of human thought.

I suspect that one can construct games where self awareness coupled with the capacity for recursive thought conveys a strong advantage.

I'd enjoy talking about this more. Available this afternoon (Sunday) and happy for distraction from excessive work.

Martin and I live around the corner from each other and are enjoying hanging out and talking about just these kinds of things. You should join us one of these days.

Seth

On Sat, Nov 5, 2016 at 8:50 AM, jeffrey E. <jeevacation@gmail.com> wrote:

if my future particle pulled its past into the present. so that it was connected (consistent) to the . would bells theorem be described as not a non local entanglement, but the measurement of one particle influencing its past / it would also help me with the derivation of zipf's law. as the log normal distribution might fall out. if an event in the future already made it more probable for the next event. .

Seth, martin and I are stuck on evolution of self awareness. what advantage? martin originally thought for communication. so as to be able to tell someone, your state. / what does it mean to be in a state and be aware of it? does it require time. ? we describe a state from the outside as its properties in an instant. all odd math, gets me zero to the zero power. indeterminate ? is it 1 or zero. C2 is it both. ? all fun

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please note

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