

## Re: Epistemology 201: The Science of Science

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"Jason" <[jasonstevensNOSPAM@free.net.nz](mailto:jasonstevensNOSPAM@free.net.nz)> writes:

>> *You are perhaps referring to First Order Predicate Calculus (FOPC).*  
>> *And indeed, mathematicians do use FOPC. However, mathematics is not*  
>> *FOPC, and FOPC is not sufficiently expressible to allow it to be used*  
>> *exclusively.*

>> *Given a particular system of axioms, say PA (the Peano Axioms),*  
>> *mathematicians could in principle use FOPC applied to those axioms.*  
>> *But mathematics is not confined to working within a particular axiom*  
>> *system. Moreover, the discussion axiom system itself is part of*  
>> *mathematics.*

>*Maths is an extension of FOPC, like PA.*

Not really. Mathematics is much older than FOPC, so it doesn't make sense to say it is an extension of FOPC.

> *The ZFC axioms are conventionally used*  
> *and assumed, as far as I am aware.*

Again, not really. Mathematicians often try to make do with minimal axioms.

> *If another system is used in maths then*  
> *people need to know about it. The ZF system without the axiom of Choice for*  
> *example, can lead to the creation of two spheres out of one in topology.*

I'm not sure of your point there.

If you happen to be making a vague reference to the Banach–Tarski paradox, then you have it wrong. Banach–Tarski does depend on the axiom of choice.

> *The study of axioms don't take place in maths. It is meta-logic or meta-maths*  
> *that deals with this. Godels theorem for example is a meta-mathematical proof.*

While Goedel's theorem is meta-mathematics, nevertheless a lot of mathematics is effectively a study of axioms and their consequences.

>> >Since mathematics has evolved along-side science and plays a large part in  
>> >describing and predicting how the world works, then as a formal system goes,  
>it  
>> >seems to be on the money as far as capturing something about the world.

>> That's your opinion. As a mathematician, I have a different  
>> opinion. I consider it important that mathematics is not about the  
>> world. Roughly speaking, mathematics is about what would happen if  
>> reality did not intrude. We discover a lot about reality by seeing  
>> how it differs from the mathematical ideal.

>Fair enough. The formal system of maths is ripe for exploration. People study  
>it divorced from the world. But why spend so much time on maths and not some  
>other formal system? I think because of the close link maths has with the  
>world.

There you go again. You talk about "the formal system of maths", but there is no such formal system. Then you suggest that we should instead study some other formal system. It is gibberish.