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John Baez <johnb@ucr.edu>

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belief method
5 messages

JAMES DOLAN <james.dolan1@students.mq.edu.au>　　　　　　　　Mon, Mar 28, 2022 at 4:30 PM
To: john.baez@ucr.edu

i think the word i was groping for (as a sort-of opposite to "adept" in a sort-of moore-postnikoff-like hierarchy of believers) was "novice" rather than "initiate" ....

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John Baez <john.baez@ucr.edu>　　　　　　　　　　　　　Mon, Mar 28, 2022 at 10:47 PM
Reply-To: baez@math.ucr.edu
To: JAMES DOLAN <james.dolan1@students.mq.edu.au>

Hi -

> i think the word i was groping for (as a sort-of opposite to "adept" in a sort-of moore-postnikoff-like hierarchy of believers) was "novice" rather than "initiate" ....

That's better - an initiate is already initiated, so they have a higher level of indoctrination.

Speaking of terminology, Ben-Bassat's term for the "2-Neron-Severi group" is "holomorphic Brauer group". This threw me at first but now I'm remembering that from the monoidal bicategory of

algebras over a commutative ring R
bimodules
bimodule homomorphisms

one gets its core, the so-called Brauer 3-group, and this has

pi_1 = Brauer group of R
pi_2 = Picard group of R
pi_3 = group of units of R

I'm not quite getting what this has to do with gerbes, but at least it fits Brauer groups and Picard groups into some common framework.

Best,
jb

JAMES DOLAN <james.dolan1@students.mq.edu.au>　　　　　　　Tue, Mar 29, 2022 at 7:45 AM
To: john.baez@ucr.edu

let me start writing down some of the key definitions here, even if some of them remain tentative:

definition: let k be a symmetric monoidal locally presentable category; then a "belief doctrine over k" is a monad on the bicategory of locally presentable k-enriched categories.

definition: for a belief doctrine d over k, a "d-theory" is a d-algebra (treating d as a monad).

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equivalent pair of definitions: for an interpretation t1 -j-> t2 of d-theories and an object c1 in t1, a "j-belief on c1" is equivalently either:

1: a strong lift of c1 along the right adjoint of j, or:
2: a continuous strong extension of the hom-functor t1^op ---"[--,c1]"---> k along j^op.

definition: a "j-believer" is an object c1 together with a j-belief on it.

the assertion of equivalence of the two definitions is the main lemma here (proved by means of the status of the bicategory of locally presentable categories as an "adjoint-functor-theorem paradise") , and in the case where the extension j of the theory t1 is given by "sketch" (meaning a sort of categorified presentation of the theory t2 as an extension via j of the theory t1), this main lemma establishes the mechanism of the belief method: that [the syntactic category of t2, falling under the purview of the first definition] can be re-construed as [the category of j-believers as given concrete description by means of the sketch, falling under the purview of the second definition].

....
[Quoted text hidden]

JAMES DOLAN <james.dolan1@students.mq.edu.au>   Tue, Mar 29, 2022 at 10:08 AM
To: john.baez@ucr.edu

here's the quote that i keep on hand as alleged evidence that the term "belief" has been used to mean (very) roughly what it means in the context of "the belief method" even before i started trying to invent "the belief method":

"The principal objective in this paper is to show that the full
subcategory of Froehlicher spaces that believe in fantasy that every
Weil functor is really an exponentiation by the corresponding
infinitesimal object is also Cartesian-closed."

that's from https://arxiv.org/abs/0908.0843 which is from around 2009, so that's pretty late! i think that there should be much earlier examples, but i don't have any offhand.

as i've mentioned, i actually _like_ the "delusional"/"cultish" overtones of the "belief" metaphor (in part for amusement value and for pedagogical value, but possibly for other reasons as well ....), but of course there are people like lawvere with a somewhat "materialist" philosophy who presumably wouldn't like it. street told me once that some people use "see" instead of "believe" in this context, possibly out of dislike of the delusional overtones. (i was able to instantly supply the appropriate rejoinder because i'd already been experimenting with a concept related to belief for which i sometimes use the term "view" ....)

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On Mon, Mar 28, 2022 at 7:30 PM JAMES DOLAN <james.dolan1@students.mq.edu.au> wrote:
[Quoted text hidden]

John Baez <john.baez@ucr.edu>   Tue, Mar 29, 2022 at 3:11 PM
Reply-To: baez@math.ucr.edu
To: JAMES DOLAN <james.dolan1@students.mq.edu.au>

Hi -

> as i've mentioned, i actually _like_ the "delusional"/"cultish" overtones of the "belief" metaphor (in part for
> amusement value and for pedagogical value, but possibly for other reasons as well ....),

I like it too. It connects to the idea of "doctrines".   And I think you should figure out a technical use of the term "indoctrinated".

> but of course there are people like lawvere with a somewhat "materialist" philosophy who presumably wouldn't like
> it. street told me once that some people use "see" instead of "believe" in this context, possibly out of dislike of the
> delusional overtones.

Digressing a bit, my student Christian Williams uses "looking out of x" to refer to $\hom(x, -)$ and "looking into x" to refer to $\hom(-, x)$.

Best,
jb