

## Re: Me and David C. Ullrich

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*Source:* <http://sci.tech-archive.net/Archive/sci.math/2005-10/msg01425.html>

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- *From:* quasi <quasi@xxxxxxxx>
  - *Date:* Thu, 13 Oct 2005 23:42:34 -0700
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On 13 Oct 2005 18:36:51 -0700, "Elmo" <elmoritz@xxxxxxxx> wrote:

>  
>> >Would you like to define a proper experiment, or do you think that  
>> >there is no real experiment that would give the result that you claim  
>> >(or is there a 3rd option)?  
>>  
>> In a recent post in this thread, he did specify an experiment which  
>> forces the probability of 1/2, namely this one:  
>>  
>> A referee flips 2 coins.  
>>  
>> Based on the results (visible only to the ref), the ref makes one of  
>> the following 2 announcements:  
>>  
>> (1) there is a least one head  
>>  
>> (2) there is at least one tail  
>>  
>> In a case where either statement is possible, the ref picks one of the  
>> 2 announcements at random (equally likely).  
>>  
>> Based on the above experiment, if the ref announces "there is at least  
>> one head", then the probability of hh is clearly 1/2, not 1/3.  
>>  
>When the flipper flipped the coins, then looked, then chose heads, the  
>answer is 1/2.

Isn't that what I just said?

>> So the issue here is not a mathematical one, but one of language.  
>>  
>> I discussed this in a prior reply in this thread.  
>>  
>> If all you are told is "there is at least one head", and if the  
>> problem never mentions that there were other possible announcements,  
>> then you can't invent these other scenarios.  
>>  
>The coins landed HH and the statement was made, or the coins landed HT

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>and the statement was made, or the coins landed TH and the statement  
>was made.

I have no idea what you are saying in the above statement.

>Suppose that TH happened and the statement was made. The other  
>statement would have been true. You made a false statement, the flipper  
>wouldn't have had to invent the statement to have made it.

No, it's not the flipper (the ref) who I accused of inventing anything  
— I accused you. To my view, you are reading more into the problem  
than was stated — that is, you are deciding that other statements  
were possible and even assigning probabilities to them (based on your  
concept of lack of prejudice). That's what I call inventing a  
scenario. If the set of possible statements was specified in the  
problem, then fine, that would be part of the calculation, but without  
any such specification in the problem statement, there's no  
justification for insisting that other statements were possible.  
There's no evidence for that.

>> You have no information in the given problem saying that the  
>> announcement "there is at least one tail" was even possible. The  
>> problem just states that you were told "there is at least one head".  
>> If alternative announcements were possible, then the problem is  
>> obligated to specify them and also the rules by which they would be  
>> chosen, since such alternatives clearly have the potential to affect  
>> the answer. Since the problem makes no such declarations, there's no  
>> reason to assume any other statements were possible.

>>

>You have several false statements here. When two coins are tossed, the  
>"at least one is a tail" statement is true three fourths of the time,  
>that is certainly information that it is possible.

Sure it's possible, but that wasn't the information that was given in  
the problem. Once again, the problem does not indicate that the  
statement made was one of several possible statements that could have  
been made.

> You have the obligation on the wrong foot. The obligation is on the writer to say  
>that the other statement is preempted.

This is where we disagree — permanently, perhaps.

If something else could have been said, then the problem would have to  
specify exactly what. There are many other things that potentially  
could have been said besides "there is at least one head". The problem  
is obligated to tell you all the possible statements and the rules for  
their selection. Omitting such a specification implies a natural  
default.

The most natural default, in my opinion, is to completely avoid

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inventing other possible statements.

You are insisting that the natural default is to assume the flipper could also have said "there is at least one tail". To justify that, you note the symmetry between heads and tails.

I agree that if we could assume there were 2 statements possible, then, unless the problem specifies the rules for selecting between the 2 statements, there is no reason to assume a bias (or prejudice as you call it). Hence, it would be reasonable to assume those 2 statements are equally likely, and based on that, the probability of hh is 1/2.

If instead we assume, as I do, that the natural default is to take the statement "there is at least one head" at face value as just excluding the possibility of tt, then we get the standard interpretation of "given at least one head", and based on that, the probability of hh is 1/3.

So the issue here is a simple question of how do we interpret the lack of any information about other possible statements. Do we invent them, using concepts such as symmetry? Or do we assume the statement made was one of a kind — that is, it was the only statement allowable, and it would have been made whenever it could have been made.

Once we decide what the possible statements are and the rules for their selection, the problem is fully specified. If a problem omits this information, there better be a natural default that is commonly accepted. In a sense, the concept of how to interpret a word problem is not really a math problem, but rather, a question of language, experience, common sense. On the other hand, the math world does assign default meanings to word problems. My guess is, you could probably argue that the default interpretation of many word problems in algebra and calculus goes against what you think should be the default meaning. But since math is a language too, once the tradition is established, you need to respect it or else not be understood. You can't single-handedly change the defaults of the language. That doesn't mean that you can't state a problem with your alternative meaning — it only means that you have to declare your alternative meaning in the problem itself.

quasi

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• **References:**

- ◆ **Me and David C. Ullrich**  
◇ *From: Elmo*
- ◆ **Re: Me and David C. Ullrich**  
◇ *From: sugnaboris*
- ◆ **Re: Me and David C. Ullrich**

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◇ *From: sugnaboris*

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◇ *From: quasi*

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