Dedicated to A.A.[1]

You surely have an intuition of what "causing" means. If not, bring up a vivid image of a thrombus in an artery, which is causing the obstruction of blood flow, which is causing the death of brain tissue. I am sure you can "see" and grasp and sense the sequence of causation, analogous to "seeing" and sensing the causation involved in bumping your head accidentally. No special abstract thinking is required.

You also don't need any sophistication to understand the representation of cause and effect by an arrow between two variables. For example, let SBP be systolic blood pressure, and let DBP be diastolic blood pressure. Let D be the vital status of some tissue (say, brain cells), and let S denotes symptoms (say, leg weakness). Then, I may draw

$$SBP \searrow$$
$$D \longrightarrow S$$
$$DBP \nearrow$$
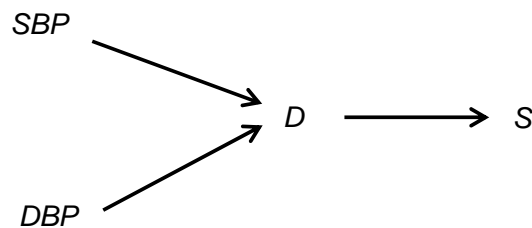
Do you have any problem with the diagram above as postulated, Nature-made, causal connections? Probably not. Does it *possibly* correspond to causal reality? Sure. Systolic pressure and diastolic pressure, two physical properties, *may be* two causes of dead brain tissue, which in turn *may be* a cause of leg weakness.

Someone, however, decided to replace that diagram as follows: Let HTpSBP = f(SBP, DBP). In words, let's derive a variable called HTpSBP, which is some mathematical function of SBP and DBP. For example,

If SBP=119 and DBP=93, then HTpSBP="a". If SBP=157and DBP=91, then HTpSBP="b". And so on.

Now, he replaced the diagram above with the diagram below:

$$HTpSBP \longrightarrow D \longrightarrow S$$
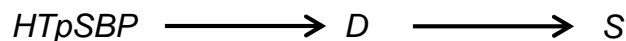
What did we get?

Answer: A joke. Nature never created such a causal structure. How can you tell? Easily.

Bring up again the vivid image of causation, where one natural property affects another (blood pressure→stroke; genotype→mutation; etc). Now think for a moment: Is the output of a mathematical function, f(SBP, DBP), a natural property that can cause brain cells to die? Did Nature decide that the physical properties, SBP and DBP, will not kill brain cells (these variables were eliminated from the diagram), whereas a function of these physical properties will do so? Can the product of math affect the vital status of cells? Of course not. That's a joke. You are looking at another example of thought bias, the funniest bias of all.

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[1] Anonymous Anonymous

Here is another one.

Let E be some cause of D, where D is the vital status of some tissue (say, brain tissue), and let D* be a measurement of D (D→D*). Let S be symptoms (say, leg weakness) and let S* be the recording of symptoms (S→S*).

Someone derived a variable CD* ("Clinical Disease") as follows:

$CD^* = f(D^*, S^*)$

If D*=1 and S*=1, then CD*=1; otherwise CD*=0.

Then, he claimed that E→CD* is a possible description of causal reality.

That's a joke, of course. Nature never created such a causal structure. A natural property, E, is never a cause of the output of a function. There is no "force of causation" between E (a property) and a value of a function (math). They belong to different worlds. As shown below, the "effect" of E on CD* contains a segment which is "math effect", the derivation of CD* from D* (and S*) through a function.

$$E \longrightarrow D \longrightarrow S$$

$$D^* \qquad\qquad S^*$$

$$CD^* = f(D^*, S^*)$$
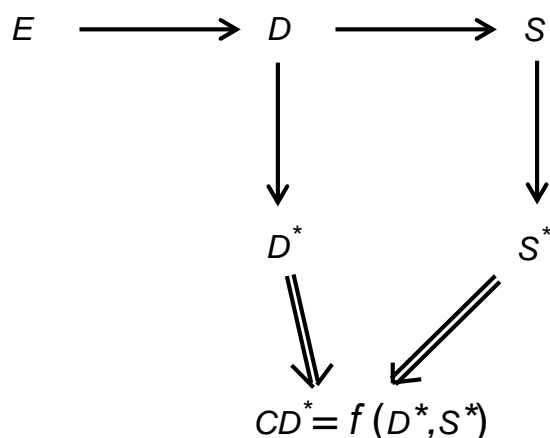
Isn't thought bias the funniest of all biases?