Just a remark

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Our examples of "shortcuts" like in Fig.1 seem to be close to the case studies where "prevention" occurs like in Fig. 2. An example of the laters is studied for instance in [1] (the "Poisoning" isomorphic examples 3.3 and 4.2). What we considered as "shortcuts" ($B \to D \to Z$ in Fig.1 and $A \to D$ in Fig.2) are actually defined as "short circuits" in this paper and others.

In the poisoning case, if the assassin A poisons the drink (A black) the victim D dies (D black) and the ready-to-poison (R black) backup assassin B doesn't need to poison the drink (B white). If A doesn't poison the drink (A white) the ready-to-poison (R black) B poison the drink (B black) and D dies (D black). So in the case where the path $A \to D$ is active, the node B is prevented, i.e. not activated. The question that Halpern and Hitchcock are dealing with is whether B is a cause or not (or more or less a cause).

But in our case (Fig.1), it is not really about preventing shortcut as in Fig.2. Here, with fixed time step, D activates Z in the same time as C activates E. Then the path $F \to G \to H \to I \to Z$ is not active at the very moment where Z has just been activated. However let's imagine that the activation of each node occurs rapidly such that a node is activated just milliseconds after its parent is, and that the causality keeps flowing from F to Z just after Z has been activated by D. Moreover let's maintain the activation of Z (black) after its activation by D. Then in this setup the activation of D and I is delayed by only milliseconds (represented by the grey scale from F to I).

It seems that this kind of temporal consideration in causal chain (with short circuits) is not really studied, whereas I think it's a phenomenon very common in the nature...

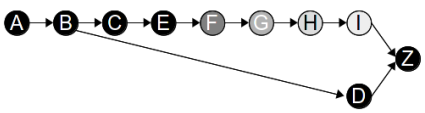

Figure 1

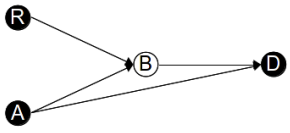

Figure 2

References

[1] Halpern J.Y. and Hitchcock C. Graded causation and defaults. *The British Journal for the Philosophy of Science*, 66(2):413–457, 2014.