



On the Nature of Coincidental Events

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Received: 26 April 2020 / Accepted: 5 September 2020
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Abstract

It is a common opinion that chance events cannot be understood in causal terms. Conversely, according to a causal view of chance, intersections between independent causal chains originate accidental events, called “coincidences.” The present paper takes into proper consideration this causal conception of chance and tries to shed new light on it. More precisely, starting from Hart and Honoré’s view of coincidental events (Hart and Honoré in *Causation in the Law*. Clarendon Press, Oxford, 1959), this paper furnishes a more detailed account on the nature of coincidences, according to which coincidental events are hybrids constituted by ontic (physical) components, that is the intersections between independent causal chains, plus epistemic aspects; where by “epistemic” we mean what is related, in some sense, to knowledge: for example, access to information, but also expectations, relevance, significance, that is psychological aspects. In particular, this paper investigates the role of the epistemic aspects in our understanding of what coincidences are. In fact, although the independence between the causal lines involved plays a crucial role in understanding coincidental events, that condition results to be insufficient to give a satisfactory definition of coincidences. The main target of the present work is to show that the epistemic aspects of coincidences are, together with the independence between the intersecting causal chains, a constitutive part of coincidental phenomena. Many examples are offered throughout this paper to enforce this idea. This conception, despite—for example—Antoine Augustin Cournot and Jacques Monod’s view, entails that a pure objectivist view about coincidences is not tenable.

Keywords Chance · Causality · Epistemic access · Ontic independence · Coincidences · Mind-dependence

Though the paper is an outcome of a common, shared effort, Alessandra Melas is mainly responsible for Sects. 1, 2, 4.2., 4.3., and Pietro Salis is mainly responsible for Sects. 3, 3.1., 3.2., 4. 4.1.

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1 Introduction

A subclass of chance events¹ of particular interest is that called “coincidences.” Coincidences are events that come from the intersections between independent causal chains. One example, provided by David Owens, is an accidental collision between a person sitting in a particular place and a falling cargo door:

It is a coincidence that I was sitting at the spot where the cargo door fell—this event can be analyzed into two events (a) my sitting at place A and (b) the cargo door’s landing at place A, events which have quite independent causal histories [...] (Owens 1992: 12).

One of the leading views regarding chance is provided by Antoine-Augustin Cournot. As he highlights, the core of this conception of chance consists of the independence of the intersecting causal chains:

It is necessary, to be more precise, to focus exclusively on what is fundamental and categorical in the notion of chance, namely, the idea of *independence* or non-solidarity among various series of causes [...] (Cournot 1851: 56, the italics are ours).²

Therefore, coincidental events are defined as the result of intersections³ between independent causal lines. Another relevant quotation from Cournot is the following:

¹ The paper does not engage in a metaphysical discussion on the distinction between processes, events, properties, times, and so on. However, we take it for granted that coincidences are events and not properties. Though coincidences are hybrids, that is composed entities, they are individuals, since they are not construed as universals. The difference between individuals and properties lies in the fact that individuals are singularities while properties “recur.” Since coincidences are rare entities, they cannot be treated as recurrent and universal properties.

² «Il faut, pour bien s’entendre, s’attacher exclusivement à ce qu’il y a de fondamental et de catégorique dans la notion du hasard, savoir, à l’idée de l’indépendance ou de la non-solidarité entre diverses séries de causes [...]».

³ The examples provided thus far consider causal intersections as causal interactions, and this is what we want to do for the whole paper: when we talk about “intersecting causal lines” we are talking about some kind of *physical* interaction between causal processes. Of course, not all intersections are like this. Sometimes, for example, we have intersections between processes, but they intersect only spatially and not temporally, or vice versa, in a way that there is not any interaction. Suppose I am watching a TV program on Boris Pasternak. Meanwhile, my best friend, without knowing what I am doing and without knowing anything about that TV program, is reading *Doctor Zhivago*. We would say that it is a coincidence that at the same time (but in different places) my friend and I are doing something that concerns Boris Pasternak. Suppose I am in Prague with a friend, and we decide to go out to visit the city. After walking for three miles, I decide to sit on one of the 1.000.000 benches that are in Prague. My friend takes a photo with me sitting on the bench. I come back home, and I show that photo to my mum, who says to me that ten years before, my dad took the exact same photo with her sitting on the same bench in Prague. We would say it is a coincidence that my mum and I were sitting in the same place (but at different times) in Prague.

Those events brought by the combination or the meeting of other events that belong to mutual independent series, are what we consider *fortuitous* events, or the result of *chance* (Cournot 1851: 52).⁴

This causal view of chance is also defended by Jacques Monod:

[...] Such is the case, for instance, in what may be called “absolute coincidences,” those, that is to say, which result from the intersection of two totally *independent* chains of events (Monod 1971: 114, the italics are ours).

However, coincidences—though they are events that can be understood in causal terms—cannot be *explained* in causal terms: we are able to say that they come from the intersection between independent causal chains, but we are not able to explain why that intersection happens. So that, coincidences are—in some sense—unexplainable events, in line with what some literature says.

With “chance,” in fact, the concerning literature indicates something that cannot be causally explained,⁵ and the same can be said for coincidences. So that, an event is chance or coincidental if:

- it occurs without a definite and identifiable cause, contradicting the Principle of Causality that assigns a precise cause to every event;
- it has happened for causes that are certainly there but are non-linear.⁶

This last case illustrates why coincidences are unexplainable events.⁷ The non-explicability of coincidences is exactly represented in terms of the mutual *independence* between the causal lines involved.

Since the involved causal chains have independent causal histories, to explain each individual causal line is not to explain the intersection between the involved lines.⁸ In the example of the cargo door accident, explaining the behaviour of every

⁴ «Les événements amenés par la combinaison ou la rencontre d’autres événements qui appartiennent à des séries indépendantes les unes des autres, sont ce qu’on nomme des événements *fortuits*, ou des résultats du *hasard*».

⁵ As Wesley Salmon maintains (Salmon 1977: 162), following a conception that seems to go back at least to Aristotle, “to give scientific explanation is to show how events [...] fit into the causal structure of the world.” So that, if it is not possible to provide to an event a causal explanation, then that event must be considered chance.

⁶ Causes may cross in a non-predictable and non-understandable way.

⁷ The relation between coincidence and explanation can be extended in principle to a large number of cases. In particular, many issues rise in connection with the passage from physical to biological explanation. This is surely an interesting and challenging terrain for the approach we are defending here. Nonetheless, it requires much more space and specific work to be done, especially given the fact that the already complex debate is undergoing a recent twist due to issues concerning the notion of ‘emergence’ and the concept of ‘delegated causality’ (see Vidunas 2019). Many thanks to an anonymous reviewer for relevant examples and many suggestions for future work in this particular direction.

⁸ In this context, an explanation is conceived as something that cannot be reduced to laws and background conditions. This is because laws are common to law-like phenomena and accidents. As in Owens’ example, all of the cargo doors falling down fall according to gravitational forces, but there is no law of nature according to which a particular cargo door must fall in that way and in that particular occasion.

single intersecting causal process is insufficient to understand why the accident happened:

To explain each of the parts of an event is not necessarily to explain the whole event. To explain the whole we must show that its parts share a common cause, however complex and heterogeneous the elements of that common cause may be (Owens 1992: 13).

To better clarify this point, let us consider Monod's example (Monod 1971: 114). In this example, Dr Brown is going to visit a patient for the first time. Meanwhile, Mr Jones is fixing a roof in the same area. When Dr Brown comes across Mr Jones' work site, Mr Jones inadvertently drops his hammer, and the trajectory of the hammer intersects with the trajectory of Dr Brown, who dies (Fig. 1).

In this case, it is possible to explain why Dr Brown is going to visit his patient and why Mr Jones' hammer is falling, as events considered in isolation, but—since the causal lines involved are independent from each other—it is not possible to explain the intersection between Dr Brown's trajectory and the hammer's trajectory.

To sum up, coincidences are events that can be *understood* in causal terms, since they come from the intersection between independent causal histories, but they are—at the same time—events that cannot be *explained* in causal terms, given the independence between the causal chains involved.⁹ In any case, the independence between the causal lines plays a crucial role in order to understand what coincidences are.

However, someone may object that not every event that comes from the intersection between independent causal lines is a coincidence. In that case, a good question could be the following: Is the independence between the intersecting causal lines sufficient to say that an event is a coincidence? It will soon be clear that our answer to this question is in the negative. This study is devoted to explaining why.

Following Achille Varzi's distinction between ontology and metaphysics,¹⁰ coincidences are constituted not only by the ontic intersection¹¹ between independent causal chains but also, metaphysically, by certain epistemic conditions. The main goal of this work is to defend the idea that the epistemic aspects of coincidences are constitutive parts of coincidental phenomena. This view was stated by Herbert Lionel Adolphus Hart and Antony Maurice Honoré, who said—in their *Causation in the Law*—that coincidences, as well as the fact that they come from the intersection of independent causal lines, (a) are events that are very unlikely by ordinary standards, (b) for some reason are significant or important, and c) occur

⁹ An interesting view concerning this point is provided by Tamar Lando. According to that conception, coincidences could share a common cause, but in that case they still fail to be explained: the two independent causal lines can issue from a common cause without an adequate explanation for the relational fact (in our example: the matching between the hammer and Dr Brown's head). Lando's view, separating causation and causal explanation, states that not every common cause is an explanatory common cause. For a more detailed account of this approach, see Lando (2016).

¹⁰ See Varzi (2005: 7–18). Ontology here is the philosophical investigation about *what there is*; metaphysics deals with the question about the deep, or ultimate, *nature* of what there is.

¹¹ Pay attention to the possible conflation between the notion of ontic intersections and the supposed conception of ontic coincidences. As will be clearer through this paper, we deny the existence of ontic coincidences: ontic intersections do not suffice to yield coincidences.

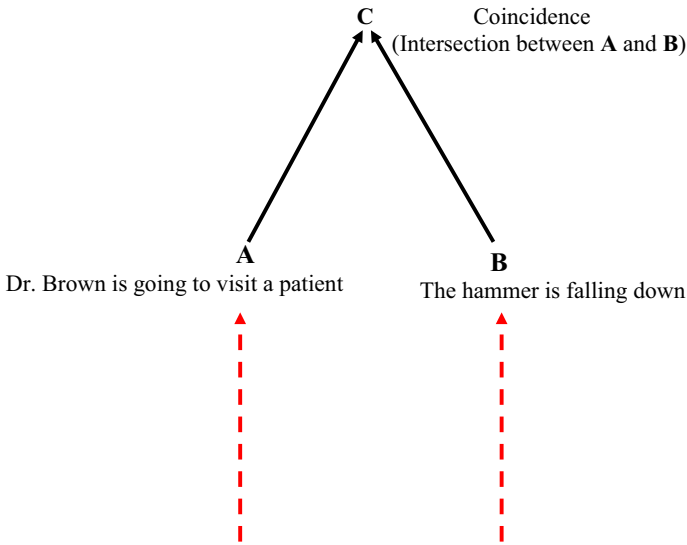


Fig. 1 Monod's example of coincidence (the dotted lines in the figure represent the two independent causal histories of *A* and *B*)

without any human contrivance (Hart and Honoré 1959: 74). Starting from Hart and Honoré's idea, we develop a new account on the nature of coincidences, according to which coincidental events are—metaphysically speaking—hybrids constituted by ontic and epistemic components. Accordingly, we point out the insufficiency of a pure objectivist view of coincidences and of a purely object-oriented approach.

We state that the physical intersections between causal lines are surely mind independent. Whereas, the acknowledgement of the independence between the intersecting causal lines that one can achieve is not mind independent, and furthermore, it even adds, together with certain mental aspects of the subject performing the acknowledgment,¹² new features to the same intersections. These new features are epistemic—and indeed mental—characteristics, and although they do not belong to the ontic dimension of the intersection, they show up in the relevant metaphysical account of coincidences. Hence, we take position against a kind of “reductionism,” according to which coincidences can be reduced to mere intersections between independent causal chains. Finally, our conception—in line with Hart and Honoré's position—is a kind of “hybrid” and non-reductionist view, where explanation is given by different elements.

The main problems we investigate in this work are the following:

1. The *ontic* dimension of coincidences:

Are there intersections between truly independent causal sequences?

Even if we state that there are some intersections between independent causal lines, one may say that the independence is not real, but only illusory. Thus,

¹² See below for a taxonomy of these non-ontic features, which we address in the final sections of the paper.

this question deals with the nature of the independence between the involved causal chains. We will see whether the physical causal chains can be really independent or whether they depend, for example, upon a range of common causes.

2. The *epistemic* dimension of coincidences:

- a. How important is the role of epistemic access in identifying the independence between causal lines?

If we admit that ontic coincidences do not exist, since coincidences are “objects” constituted by an ontic part—that is, the intersection between independent physical causal lines—plus epistemic parts, in a world without minds and without subjects having any epistemic access, it does not make any sense to talk about coincidences.

- b. How important is the degree of epistemic access in identifying the independence of causal lines?

Concerning this question, the following must be said: there could be intersections between independent causal lines, but as our knowledge is insufficient, we tend to consider them to be intersections between non-independent causal lines. Conversely, there could be intersections between non-independent causal lines, but as our knowledge is insufficient, we tend to consider them to be intersections between independent causal lines. This means, for example, that for an agent *A*, an event comes from the intersection between independent causal chains (and maybe *A* is right in believing this) while for an agent *B*, the same event comes from the intersection between non-independent causal chains (and maybe *B* is wrong about the nature of this non-independence).

3. The *collateral aspects of the epistemic dimension* of coincidences:

Is there something more in coincidences than intersections between independent causal lines and epistemic access? Are concepts such as relevance, beliefs, and so on, necessary in order to consider an event a coincidence?

The epistemic and doxastic background is quite important in choosing the causal lines involved. The way we perceive and conceptualize things has a strong impact on our selection among causal lines. As a matter of fact, every intersection can be a coincidence, such as the fact that my house is next to the bakery and the fact that my school is next to the post office. Why a hammer dropping from the roof and beating the pavement of the street is not usually considered as being a coincidence, whereas Mr Jones’ hammer falling down and hitting Dr Brown’s head is conceived as a coincidence? Maybe because the latter is much more impressive and shocking for us than the former? Our perceptions and feelings play a crucial role in handling such situations. Thus,

mere intersections among independent causal lines are not sufficient to fully determine whether an event is a coincidence. There is something more in coincidences—something at the mental level—that makes an event a coincidence.

This essay aims to show the following: (a) the independence of involved physical causal lines is a constitutive part of coincidences; and (b) epistemic aspects, such as epistemic access, expectations, relevance, and so on, are also constitutive elements of coincidences (Fig. 2).

To make things clearer, consider the following:

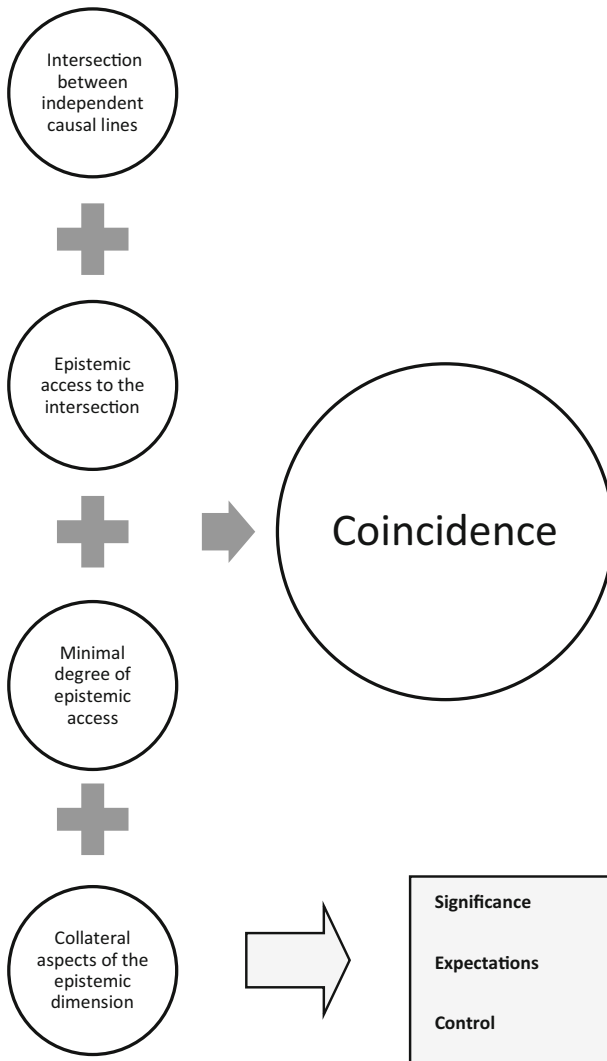


Fig. 2 The various dimensions of coincidences

Thus, on the one hand, we face that physical causal intersections are the basis of what we call the *ontic* dimension of coincidences. On the other hand, we face the need for a mind to acknowledge that an intersection is a coincidence, and this is the basis of the *epistemic* dimension of coincidences. As we will see, both these dimensions pose a series of conditions.

2 The Ontic Dimension: Are There Intersections Between Truly Independent Causal Sequences? Some Degrees of Causal Independence

One of the big problems in philosophy, as well as for our understanding of reality, is the nature of causality. There are many conceptions of causality, and no account is considered as dominant in the debate. This paper will not engage in a philosophical discussion concerning that problem. Concerning causality, we endorse a generally realist point of view, according to which the order of causes is an *objective* feature of the world.¹³ Starting from this realist point of view, the relevant problem deals with the nature and scope of the independence between the involved causal chains: Are intersections between independent causal lines really possible?

Considering Monod's example again, the intersection between Dr Brown's trajectory and the hammer's trajectory could be an intersection between independent causal chains. And this intersection would count as an example of the view defending the general possibility of causal independence. On the other hand, a subject could wrongly attribute independence to certain causal chains, even though these are not in fact independent. For example, there could be a common cause, or a range of common causes, in the past (future) of the intersecting causal lines.

This point should be analysed in more depth, in order to understand how much some common causes can affect the independence of the causal lines.

The idea of a common cause, or of a range of common causes, can be defined in different ways, composing a spectrum of options. These options show, on one side, the idea of a common cause or a range of common causes as totally affecting the independence of the causal sequences, and on the other side, the idea of a common cause or a range of common causes that, in different degrees, make independent the causal forks,¹⁴ which go on, exponentially, getting more and more complex.

More precisely, when we think of the degree of *independence* between the intersecting causal lines, we deal with two main options:

- The independence is *global*: There is no direct, or indirect, causal link between the converging causal lines we take into consideration, and the causal lines involved do not share any direct, or indirect, common cause in their past.

¹³ Since our target is to show that coincidences are at least partly mind-dependent events, and since anti-realist conceptions of causality would reach this result *a priori*, the interesting challenge for our view is to inspect whether these results can also be reached from this realist conception. So, our commitment to realism here plays a methodological role.

¹⁴ By forks, we mean the causal lines that at certain points intersect and then converge. Look, for example, at Fig. 1 as an instance of converging causal lines in a fork.

Fig. 3 Direct causal link

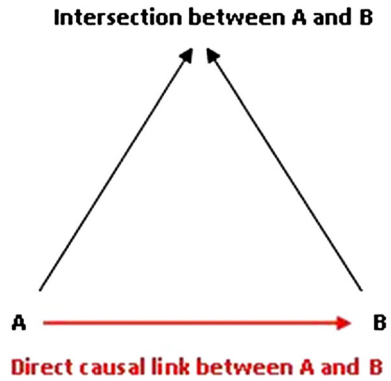
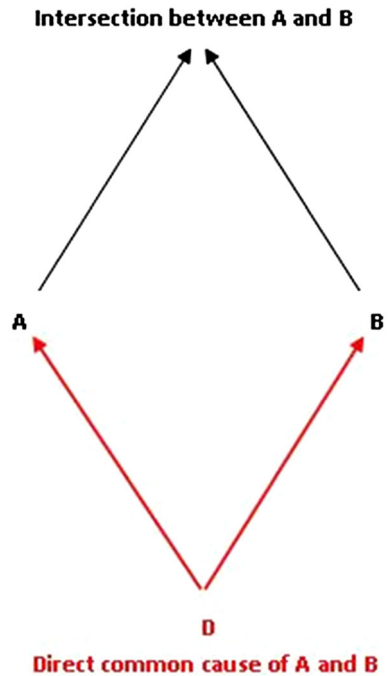


Fig. 4 Direct common cause



- The independence is *local*: There is some indirect, but not direct, causal link between the converging causal lines we take into consideration, or the causal lines involved share some indirect common cause in their past. In this case the causal lines can share a common cause, but—since this common cause is ancient—it does not have any explanatory power: it can explain why the distinct causal processes are given (Dr Brown going to visit a patient, and the hammer falling down), but it does not explain why they match.¹⁵

¹⁵ This view is supported by the distinction between causation and causal explanation, of which a quite complete and detailed illustration is provided in Lando (2016).

To specify the meaning of the word “direct,” it may be useful to employ the definition of what Patrick Suppes (Suppes 1970), in his outstanding contribution on the subject, called “direct causes:”

[...] An event $B_{t'}$ is a direct cause of A_t if and only if $B_{t'}$ is a *prima facie* cause¹⁶ of A_t and there is no t'' and no partition $\pi_{t''}$ such that for every $C_{t''}$ in $\pi_{t''}$

- i.
 $t' < t'' < t$,
- ii.
 $P(B_{t'}C_{t''}) > 0$,
- iii.
 $P(A_t|C_{t''}B_{t'}) = P(A_t|C_{t''})$.¹⁷

Therefore, a direct causal link between, for example, A and B is a link that is not intercepted by any intermediary I , and a direct common cause D of A and B is a common cause that is not intercepted by any intermediary A' between A and D or by any intermediary B' between B and D .

The following Figs. 3, 4 can make that clearer (Melas 2017: 689):¹⁸

Whereas an indirect causal link between A and B is a link that is intercepted by some intermediary I ; and an indirect common cause D of A and B is a common cause that is intercepted by some intermediary A' between A and D , or by some intermediary B' between B and D .

The following Figs. 5, 6 can make that clearer (Melas 2017: 690):

Now, we can explicate the *global* independence between two processes, A and B , which belong to different causal chains in the following terms. A and B are *globally* independent if they are probabilistically independent, so that the following is true:

$$P(A|B) = P(A)$$

and

$$P(B|A) = P(B).$$

The probabilistic independence between A and B is not due to any intermediary I of A and B . Hence, the following is not true:

$$P(A|B \wedge I) = P(A|I)$$

and

$$P(B|A \wedge I) = P(B|I).$$

¹⁶ According to Suppes (1970: 12):

The event $B_{t'}$ is a prima facie cause of the event A_t if and only if:

- (i) $t' < t$,
- (ii) $P(B_{t'}) > 0$,
- (iii) $P(A_t|B_{t'}) > P(A_t)$.

¹⁷ Suppes (1970: 28).

¹⁸ For a different exploitation of the connection between common cause and causal intermediaries see Lando (2016).

Fig. 5 Indirect causal link

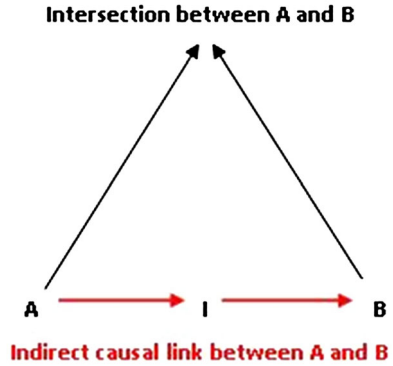
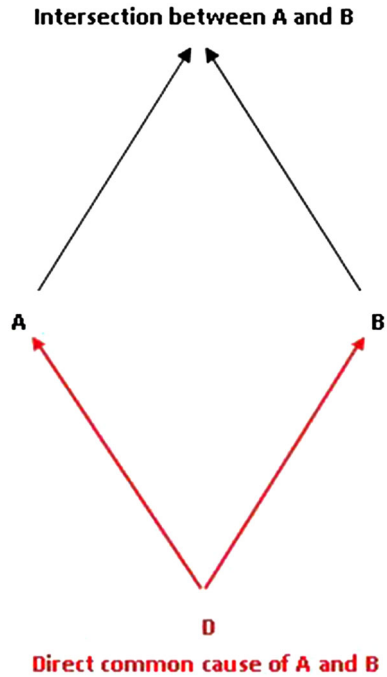


Fig. 6 Indirect common cause



Moreover, the probabilistic independence is not due to any screening-off common cause in the past of *A* and *B*. As a matter of fact, given a screening-off common cause, *A* and *B* are probabilistically independent of each other (see Reichenbach 1956: 160–161). Therefore, in this case, the probabilistic independence is not *conditional* but *absolute*.

The *local* independence admits the existence of ancient common causes and indirect causal links between the processes involved. So, given any intermediary *I* of *A* and *B*:

$$P(A|B \wedge I) = P(A|I)$$

and

$$P(B|A \wedge I) = P(B|I).$$

Moreover, given any indirect common cause D of A and B , any intermediary A' between A and D , and any intermediary B' between B and D :

$$P(A|B \wedge B' \wedge A' \wedge D) = P(A|B' \wedge A' \wedge D)^{19} = P(A|A' \wedge D)^{20} = P(A|A')$$

and

$$P(B|A \wedge A' \wedge B' \wedge D) = P(B|A' \wedge B' \wedge D)^{21} = P(B|B' \wedge D)^{22} = P(B|B').$$

In this case, the independence is not *absolute* but *conditional*. A and B are independent given any intermediary between A and B or any intermediary between a common cause D and A and a common cause D and B . Otherwise, the following is true:

$$P(A|B) \neq P(A)$$

and

$$P(B|A) \neq P(B).^{23}$$

This kind of independence very closely resembles a description given by Cournot:

A man has, from his father and mother, two sets of ancestors; and in ascending order, the paternal and maternal lines branch off to each generation. He can become—in turn—the origin or the joint author of several descendant lines, which—once from the common source—will not cross over anymore, or will cross accidentally, by family alliances. In a lapse of time, each family or genealogical line contracts alliances with a multitude of other lines; but many lines, in much larger quantity, spread collaterally, remaining perfectly distinct and isolated from each other [...] (Cournot 1851: 50).²⁴

This example emphasizes the potentially very complex outcome of the diverging of trajectories from a common cause or a range of common causes. The case for human generation and proliferation shows a succession of diverging causal interventions. What happens earlier can hardly be used *exclusively* to account for the complex intersections that come later.

Thus, although in many cases we are not able to admit *global* independence, we are at least able to admit *local* independence.

Furthermore, we can also talk about something like partial independence between the causal lines involved. Concerning that, the following quotation from Owens is very interesting:

¹⁹ This is because B' is an intermediary of B and D in a way that it screens off B from D .

²⁰ This is because D screens off A' from B' .

²¹ This is because A' is an intermediary of A and D in a way that it screens off A from D .

²² This is because D screens off B' from A' .

²³ For a more detailed account of this approach, see Melas (2017).

²⁴ «Un homme tient, par ses père et mère, a deux séries d'ascendants; et dans l'ordre ascendant, les lignes paternelle et maternelle se bifurquent à chaque génération. Il peut devenir à son tour la souche ou l'auteur commun de plusieurs lignes descendants qui, une fois issues de la souche commune, ne se croiseront plus, ou ne se croiseront qu'accidentellement, par des alliances de famille. Dans le laps du temps, chaque famille ou chaque faisceau généalogique contracte des alliances avec une multitude d'autre; mais d'autre faisceaux, en bien plus grand nombre, se propagent collatéralement, en restant parfaitement distincts et isolés les uns des autres [...]».

But there are many events [...] whose components share some, but not all, of their causal ancestors. Consider the fact that I am on the same cruise as my old enemy. [...] Perhaps a full explanation of why I am on that cruise will have nothing in common with a full explanation of why he is on that cruise. But this is unlikely. Suppose that I am cruising partially because the weather is hot and I wish to escape to the cool sea. This may well be why he is cruising also. So there is at least one causal factor which is relevant both to my presence and to his presence on the liner. [...] He is on that particular boat partly because it is calling at ports adjacent to antiquities which would bore me, but he has not heard of the liner's well-known jazz band which I am looking forward to hearing. So there are causal factors which are relevant to my presence but not to his, and vice versa (Owens 1992: 8).

This preliminary assessment of possibilities related to causal independence has an immediate upshot: *it is not a priori mandatory to dismiss the very idea of an independence of causal lines*. There is room, in principle, for an effective mutual independence between causal chains.

3 The Epistemic Dimension: Are Coincidences Mind-Dependent?

As already introduced, the epistemic and doxastic background is quite important in choosing the causal lines involved in the relevant intersections we are after. The way we perceive, understand, and conceptualize things has a strong impact on, and many implications for, our selection among causal lines—with different interests and (conceptual) resources we would select different features and lines. As a matter of fact, every intersection can be in principle a coincidence, such as the fact that my house is next to the bakery, the fact that my school is next to the post office, the fact that my bike is identical with Alfred's, and the fact that today the TV is broadcasting the very same movie I was thinking about this morning. But this simple consideration about intersections will not do. *Why is a hammer dropping from the roof and beating the pavement of the street not usually considered as being a coincidence, whereas Mr Jones' hammer falling down and hitting Dr Brown's head is conceived instead as a coincidence?* This question strikes us as cutting the issue pretty deep. Maybe we have these insights because the latter example is much more impressive, shocking, and bearing relevant consequences for us than the former? Our perceptions, interests, and feelings play a crucial role in order to handle such situations. If causal intersections *would suffice* to find something coincidental, then *we should* find coincidental *every* causal intersection. But it is a fact that this is not the case. Thus, mere intersections among independent causal lines are not sufficient to fully determine whether an event is a coincidence or not. There is *something more* in coincidences—something at the mental level—that makes an event a coincidence. With these considerations in place, now we need a closer inspection on what it is this “something more” that is required to properly distinguish between intersections that we find and those that we do not find to be coincidental: our basic insight, here, is to tackle issues concerning our knowledge of these intersections, i.e. *epistemic* features.

Therefore, coincidences are not reducible only to the ontic dimension, which is constituted by the intersection between independent causal lines. They need to involve epistemic features. But how can we think about such features? How exactly do epistemic aspects affect the metaphysical nature of coincidences? To answer this question, let us look at the following distinction made by Richard Rorty (Rorty 1998):

- (1) *Causal* independence: Natural processes and events can exist and operate independently from our minds and will.
- (2) *Representational* independence: A privileged vocabulary that lets us pick up things “as they are in themselves,” independently from a particular point of view.

We do not have such a super-privileged vocabulary that would enable us to pick up things “as they are in themselves,” independent from any point of view. Representing and describing things in one particular way rather than another can strongly modify the way we look at them.

Thus, while intersecting causal lines are causally independent from us, they are *not* representationally independent, and coincidences are *not* representationally independent, either. It appears that our minds are “deciding” and “determining” when and whether certain events are coincidences and when and whether they are not. This approach basically distinguishes between independent intersections that may happen unnoticed from those that can be spotted and appreciated by minded observers. The very concept of a coincidence, as we said, involves considerations concerning our interests and perspectives—it directly entails that certain facts and events can be *found to be* coincidental, while others cannot.²⁵ So, all our grasp of coincidences is connected with the basic fact that they are not at all independent from our perspectives and representational means.

According to our view, coincidences involve a strong representational dependence: features, abilities, and activities of the subject compose coincidences by representing them as such. Since they involve such mind-dependence, from a metaphysical point of view, coincidences are at least partially mind-dependent events or objects. How do we understand such features?

3.1 The Role of Epistemic Access

A first aspect to notice is the following. There could be intersections between independent causal chains that we are not able to recognize because we do not have epistemic access to them. Let us consider Monod’s example again: Dr Brown is going to visit his patient for the first time. At the same time, in the vicinity, Mr Jones is fixing a roof with a hammer. When Dr Brown comes across Mr Jones’ worksite, Mr Jones’ hammer falls down, and the trajectory of the hammer intersects Dr Brown’s trajectory. The hammer hits Dr Brown’s head, causing his sudden death.

²⁵ This would also count as an implicit argument for a primacy of epistemological issues over ontic ones, at least in contexts such as this, where epistemic access makes all the difference in the world already in simply conceiving the target of the investigation.

First, we should keep firm the trivial, though necessary, statement that only the presence of at least one external observer could acknowledge this event the status of an intersection between independent causal chains. Epistemic access is the filter that permits us to pick up the independent causal sequences setting up the intersection: it is the effective condition needed in order to recognize an intersection as such. Intersections happen, but we need epistemic access in order to identify them. The relevance of this point can be easily underestimated, but ask yourself: Would that intersection count *as a coincidence* in a mindless universe?

So far we offered an ontic condition about the independence of causal chains, and a general epistemic condition dealing with epistemic access: these are the preliminary basis to a further better understanding of such events.

To conclude, the intersection between independent causal lines, together with the *acknowledgement* of such an intersection, is a requirement for calling an event a coincidence.²⁶

3.2 The Degree of Epistemic Access

The degree of knowledge that a person could have is very relevant in recognizing the intersection between independent causal chains. Let us consider again Monod's example of Dr Brown's death. In that case, if there are no witnesses, then of course it does not make sense to talk about an intersection; but if there are witnesses, the *degree* of knowledge they have is essential. An agent *A* could see an event *E* as the result of the intersection between independent causal chains while an agent *B* does not, because they have a different degree of epistemic access. In order to recognize the ontic layer of coincidences, we need a minimal epistemic perspective in play. Intersections are recognized as such only because we have proper access to them. Appealing to such a role for epistemic access may involve further complications, such as the distinction between ordinary and specialist epistemic access and the justifications that we make for distinguishing different degrees of access. We can imagine, in fact, situations where acknowledging the independence of certain causal chains is open only to a specialist in a particular research or professional field, and the knowledge of ordinary men is not sufficient. Suppose, for example, the case Mr Jones is accused of murdering Dr Brown. He now seriously risks of being not believed by the judge, and convicted of murdering Dr Brown. The defence lawyer here has to show the independence between Dr Brown's trajectory and hammer's trajectory, and—in order to do that—he needs to have a very specialist and specific knowledge, such as the results of a legal report and so on.

Moreover, the maximum degree of access entails something like a God's eye view, a cosmic exile, or something like that (Laplace 1814; Quine 1960; Putnam 1981). To claim that a certain causal independence exists in itself, independently of our ken, would count as endorsing an absolute perspective. That perspective is quite hard to endorse since it is external from, more reliable and wider than, our own epistemic stance (and, at least for some, metaphysically extravagant).

²⁶ However, this requirement alone is not sufficient. See below.

Putting aside the controversial issue of absolute perspectives and putative omniscience, we must at least be able to make a distinction, at any rate in principle, between appropriate epistemic access and a poor kind of epistemic access. We need this in order to determine who is right (or wrong) between agent *A* and agent *B*, and to properly understand their disagreement. The possibility of this difference/disagreement, in fact, is very important for our view, as it can be totally cashed out in terms of epistemic access.

To define a minimum acceptable degree of epistemic access, it is necessary to highlight the features that this kind of access requires:

- A basic conceptual apparatus: the subject must be capable to properly use the concepts “cause,” “line,” “independence,” “intersection,” and so on. An epistemic subject without a suitable apparatus can attend to an intersection without acknowledging that is made out of independent lines.
- A working perceptual system: the subject must be reliably able to *perceive* two causal lines as intersecting. A subject that cannot see—one that is blind, for example—that the hammer falling down intersects with Dr Brown’s head cannot realize that it is an intersection of independent causal lines.
- Acknowledgement of the intersection between the independent causal lines, so that the intersection and the independence cannot go unnoticed: the subject must *focus* on them in order to grasp them. This aspect can sometimes be improved, helped, and/or replaced by reliable testimony.

All these conditions entail that any incomplete access is constitutively always inferior to minimal access, where an incomplete access indicates a degree of epistemic access which is insufficient to get the relevant facts (about the intersecting lines). This idea of an incomplete access plays a pivotal role in the explanation of the disagreement between agent *A* and agent *B*: *B* has incomplete access to the causal intersection, and does not find it coincidental as she fails to notice the independence of the causal sequences that determine the event. Imagine, for example, a variation of Monod’s case where we are not allowed to see the intersection under discussion, because there is a wall in front of us and the only thing we see is Mr Jones’ hammer falling down. As we can easily see, this incomplete access is inferior to any minimal access. We can also imagine this wall as separating two agents (*A* and *B*), and being the source of their disagreement about what is going on: *A* is over the wall and has full perceptual access to the intersection between the hammer and Dr Brown; *B* is behind the wall and all she sees is a hammer falling down. The wall here plays the role of an epistemic obstacle, depriving *B* of the very possibility to attend to the causal intersection.

To conclude, the intersection between independent causal lines, together with the acknowledgement of such an intersection and a minimal degree of epistemic access, is necessary for determining whether an event is a coincidence.²⁷

²⁷ However, these requirements alone are not sufficient. See below.

4 Collateral Aspects of the Epistemic Dimension

With all these considerations about the role of the epistemic features in place, it is now possible to raise, in a clear way, a slightly different question: Are there further *non-ontic aspects*, other than epistemic access, that can determine whether an intersection between independent causal lines is a coincidence? Is the “non-ontic” layer of coincidences given entirely in terms of epistemic access?

To answer these questions, it can be useful to consider again, in a more detailed way, Hart and Honoré’s definition of a coincidence:

We speak of a coincidence whenever the conjunction of two or more events in certain spatial or temporal relations is (1) very unlikely by ordinary standards and (2) for some reason significant or important, provided (3) that they occur without any human contrivance and (4) are independent of each other (Hart and Honoré 1959: 74).

According to what Hart and Honoré say regarding point (2), the psychological aspects cannot be removed from the definition of coincidences. This passage from Hart and Honoré, somewhat interestingly, leaving aside the fourth—‘independence’—condition, anticipates three epistemic conditions which are quite popular in the literature about epistemic luck.²⁸ Condition (1) corresponds to the ‘probability/chance’ condition (chancy events, just like lucky ones, are understood to be generally not so probable. See Pritchard 2005: 126); condition (2) corresponds to the ‘significance’ condition (“it includes what the agent would find significant were she to be availed of all the relevant facts” Pritchard 2005: 133); and condition (3) corresponds to the ‘control’ condition: the idea that chancy events escape one’s control.

Even though we suppose the “reality” of the absolute independence of intersecting causal lines and we have (minimal) epistemic access to it, that independence is insufficient to characterize an event as a coincidence. Moreover, minimal access is just a preliminary condition enabling the possibility of triggering conditions (1), (2), and (3) that, given epistemic access to the relevant facts, require that the epistemic subject “judges” what is going on (an intersection of independent causal lines) as not generally *probable*, *significant* and, at least partly, *out of her control*.

We should fill the global picture with further relevant features.

4.1 Attitudes and Beliefs

Condition (2), ‘significance,’ can be grasped more precisely by looking at intentional notions like beliefs, desires and attitudes. Intentionality is usually defined as the capacity of mental states to be about something in the world, e.g. my

²⁸ However, at this point it is important to specify that this work does not concern epistemic luck, which is a generic notion to describe the ways in which it can be fortuitous that some person has a true belief. Differently, what is discussed here is luck understood as the Aristotelian *autómaton* and *tyche*. Both notions are, in fact, very close to the coincidental notion of chance (Book II, Chapter V, Paragraph I, *Physics*).

thought “the President gave a terrible speech yesterday” is about the individual we call “the President” and the words he uttered yesterday. Furthermore, proper intentional states are taken to be contentful, i.e. they bear semantic properties, and can indeed be ‘true’ or ‘false,’ and also perform other cognitive functions like playing the role of ‘premise’ or ‘conclusion’ in inference, and so forth. According to this conception, beliefs, desires, and attitudes, all are about something in the world (comprising also other intentional states), and are all propositionally contentful, and hence we language users are capable to provide explicit (fallible)²⁹ ascriptions of such states to other people (see, for example, Jacob 2019). These basic resources help us much refining the understanding of what we mean by “representational” and “perspectival” features concerning the acknowledgment of events as coincidental.³⁰ Think about the following example from Owens:

Tomorrow is my wedding day and I crave fine weather, but the forecasters give me little grounds for hope. In desperation I pray for fine weather and, sure enough, tomorrow dawns clear and bright. Those skeptical of the power of the prayer will dismiss this as a coincidence, while many of the faithful will insist it was no coincidence (Owens 1992: 6).

Disagreement in belief, in this example, plays a central role in interpreting the event (fine weather during the wedding) as a coincidence or not: a person who believes in the power of prayer would not consider the event a coincidence; conversely, a person who does not believe in the power of prayer would consider the event a coincidence.³¹ Therefore, a doxastic difference like having different relevant beliefs is enough to acknowledge the very same event as a coincidence or not (indeed as making a difference for this). So, in a nutshell, beliefs and attitudes can be decisive in the evaluation and acknowledgment of an event as a coincidence.

Here, there is a further relevant factor in play: not only does one need to refuse the belief that the improbable outcome of the weather depends on a kind of divine intervention since that would count—in some sense—as a common cause between the two intersecting causal lines (i.e., my prayer and certain forecast conditions), but

²⁹ This fallibility is due to the pervasive phenomenon of the ‘intensionality’ of intentional ascriptions, i.e. they do not pass the test of substitution *salva veritate* under synonymy. See Jacob (2019: section 8).

³⁰ The relevance of agents’ representational capacities in order to acknowledge coincidences can be approached also the other way around: following a famous and ingenious example from Daniel Dennett, we can imagine Martian super-scientists who can provide complete Laplacian explanations of human behavior, but who also completely lack intentional notions and ascriptions (the intentional stance). Hence, such Martian super-scientists would be able to predict, by means of a very powerful physical strategy, some human behavior with a great precision. However—given their total lack of intentional notions and ascriptions (i.e. the intentional strategy)—they sometimes would miss inexorably something, ending up in bad bets. As a consequence of that, they would merely see some precise human behavior as nothing but a random, coincidental, inexplicable fact. See Dennett (1987: 25–28).

Many thanks to an anonymous reviewer for pointing this out. According to that view, coincidences are what cannot be explained. However, it remains controversial and to be seen whether one could have explanations at all in a context entirely deprived of intentional states and ascriptions (and the same point holds for coincidences). Hence, as we have already pointed out, we want to discourage this conception and say that intentionality is in place when talking about coincidences. Intentional states play a crucial role in understanding what coincidences are.

³¹ Naturally, they cannot be both right.

the event under discussion must be also *relevant* and *desired* for the agent. Therefore, the causal independence of the causal lines (fine weather, and the hope of fine weather for the wedding day) plus epistemic access in a suitable degree, in this specific case, are *not enough* to establish whether the event is a coincidence or not. That is, the psychological aspects (e.g., beliefs, desires, hopes, and interests) in this context play a very important role in defining the intersection between my prayer and some forecast conditions as a coincidence; this means that the basic elements we tend to consider when we recognize coincidental events are not only the independence between the relevant lines and a certain kind of epistemic access to it. The independence, together with the required degree of epistemic access, are necessary but not sufficient. A certain kind of psychological dependence (what we call the ‘significance’ condition) is also required, since it is often relevant in classifying an event as a coincidence.

In such a case, believers *do not acknowledge* the coincidence (to them, it is just a prayer answered), while those who are sceptical evaluate the event *as* a coincidence.³² Thus, only having epistemic access to the intersection of causal lines is not sufficient to determine whether it is a coincidence or not. Here, attitudes and beliefs play a role that is independent from simply having access to the intersection. Fine weather is not a coincidence *per se*: we need minded observers who have *not only* epistemic access to the intersection between independent causal lines *but also* relevant attitudes and beliefs in play (e.g., the desire for fine weather, the act of evaluating one type of weather as fine as opposed to others, and so forth). The attitude can work here in a constitutive way; it constitutes the coincidence. This point has interesting consequences because it entails a kind of supremacy of the psychological components (i.e., attitudes and beliefs) over epistemic access when they are relevant in distinguishing whether an intersection is a coincidence or not. In the example from Owens, without the relevant attitudes and beliefs (e.g., without being sceptical about the power of the prayer), there is simply no coincidence at all. Attention, attitudes, values, beliefs, and commitments all can play crucial constitutive roles in *understanding* what we call coincidences. These intentional states and attitudes are able to explain exactly why a particular event can be judged as significant by the agent (and why not when it is not considered significant).

This ‘significance’ condition can be spelled out also in slightly different terms, for example in terms of ‘relevance.’ Although people can see the independence between intersecting causal lines, people can still think that some intersections are not coincidences because the intersections are not, in any sense, relevant. A coincidence is something that is not only unexpected but also relevant to us. This attribution of significance, again, depends on knowledge, beliefs, attitudes, and values, all the doxastic and epistemic components of our mental lives that make a great difference when the moment comes to determine the relevance of something.

Here, relevance is a requirement that is embedded in the epistemic and the psychological sides of our ability to take something as a coincidence. Something is

³² Also superstition and astrology, being explanations in their own way, rather than providing examples of coincidences, show us that if one believes in some form of explanation, he/she sees far fewer coincidences than those who do not believe. Hence, lack of explanation appears to be a significant requirement for coincidences.

relevant for us because of what we know, what we believe, and what we have been told, but it is also relevant because we like it, love it, or find it desirable, funny, terrible, or any number of other qualities. We often come to know things that catch our interest and tend to ignore things that we find unattractive or boring. Thus, the very fact that we know something cannot be detached *a priori* from our attitudes toward it; a particular attitude can be the very basis of the fact that we know something, and it yields the possibility that if we did not like it, we would not know of it. Therefore, it is quite hard to disentangle one aspect from the other since what we know very often depends on what we find interesting, useful, and so on. Vice versa, it happens that we can come to love something only after we know it. There is not a general order to follow: the two aspects are strictly entwined in the realm of “the mental.” Relevance is crucial for the acknowledgment of coincidences from many points of view, both from our own personal amount of information and from our personal profile of attitudes. These aspects of relevance definitely are non-negotiable requirements.

Regarding coincidences, relevance/significance can be explained in theoretical (intellectual) and hermeneutic (cultural) terms: 1) the theoretical strategy determines a field of hypothesis, theories, and *specialist* practices where unexpected outcomes—determined by the intersection of independent causal lines—are meaningful, relevant, and interesting as well as surprising and puzzling; 2) the hermeneutic strategy determines a field of beliefs, shared meanings, values, laws, and *ordinary* social practices in which unexpected events—determined by the intersection of independent causal lines—are meaningful, relevant, and interesting as well as surprising and puzzling. Both dimensions are important and decisive, since we can distinguish a coincidence that is relevant in a specialist setting from one that is relevant only in ordinary contexts.

4.2 Probability

Another point worthy of discussion is what has been called, until now, the *unexpected* character of coincidences: what we named condition (1), the “chance” condition according to which the relevant event is not a probable one by common standards. The fact that causal sequences interact in a way that is not expected is very important, because expectations are mental states characteristic of epistemic subjects. Our best understanding of these expectations is cashed out in terms of subjective probable outcomes of actions and events, and hence it is a matter of subjective probability. Something is generally unexpected when it is unlikely. Our evaluations of probability dealing with what is going on around us determine what is expected and unexpected and what is likely, or very unlikely, to happen.

Indeed, our very ordinary conception of coincidences is strongly affected by our doxastic stance, by what we know, what we believe, and as well by what we expect. As a consequence, we could ask whether a non-expected intersection between events that belong to independent causal chains is still a coincidence.

Think about cases in the natural sciences. During a scientist’s work in a laboratory, if some causal sequences (e.g., those of two particles) intersect in a way that is expected, even if they are mutually independent from a causal point of view,

then what happens is no longer a coincidental event (no chance, no accident, just causal independence). In this case, since a calculation predicts the intersection or at least a hypothesis envisages it, the independence is not sufficient to make the intersection a coincidence. That intersection would be a coincidence only if it was something unexpected and not contained in the hypothesis. (It would also be, by the way, an empirical failure for previous false hypotheses.)

This is not anything new, as it is strongly reminiscent of what Aristotle says in *Metaphysics*:

Going to Aegina was an accident for a man, if he went not in order to get there, but because he was carried out of his way by a storm or captured by pirates. The accident has happened or exists, not in virtue of the subject's nature, however, but of something else; for the storm was the cause of his coming to a place for which he was not sailing, and this was Aegina (Aristotle, *Metaphysics*, Book V, 30).

Although the intersection of independent causal lines is a necessary feature for determining coincidences, it is not sufficient since the unexpected component is *always* required. There is an act of judgment, a distinct mental kind of activity, in which we decide whether a particular intersection of causal lines is a coincidental event or not. We may decide that the intersection is a coincidence, or at least we may find it to be so, but a kind of psychological activity regarding the subject is always required.

All this discussion, at this point, allows to insert this epistemic dimension in a more fine-grained definition of coincidence: a coincidence is an (unexpected) relational event that occurs through the intersection of two or more independent causal sequences. Minded observers must be able to represent the independent causal sequences as coincidental because the observers can recognize their independence; moreover, the act of recognition of coincidences as such involves many other features of our mental activities and certain epistemic conditions: values, beliefs, expectations, attitudes, desires, and whatever can make us see things differently or perceive something as odd or uncommon.³³

³³ David Hand examined extremely unlikely events, such as coincidences, miracles and so on: not only do events like those occur, according to him, but they keep occurring, and are even commonplace (Hand 2014). So that, “an inexplicable event (normally a welcome one) attributed to a god: a supernatural event” (Hand 2014: 27) turns out to be less surprising than some others almost to be expected. In his book, Hand deals with the main reasons for the not uncommon occurrence of such rarities, stating that events which seem rare, such as the coincidence of my bumping into a falling hammer while going to have a drink with friends, are to be expected. Expected coincidences are not a contradiction in terms, and living organisms also thrive on expected coincidences, anticipating them to survive and flourish. Perhaps what makes a coincidence an “improbable miracle,” is that it happens exactly to me, or to a friend of mine, i.e. the fact it is worthy of my particular attention, in a way that one can ask: Why does this good luck or bad luck happen exactly to me? According to our view a coincidence is not every effect that is brought about by the accidental crossing of independent causal lines: the ordinary man is not bothered by the frequently occurring accidental effects which are not worthy of special note, such as the fact he meets several persons as he daily walks from home to his workplace. But he finds much more worrying the mysterious occurring meeting between a falling hammer and his friend's head. Coincidences are something which “miraculously” happen to us.

4.3 Control

Another important aspect envisaged by Hart and Honoré is that these events somehow “occur without any human contrivance.” In the literature, this aspect is employed for defining the concept of epistemic luck—a generic notion to describe the ways in which it can be fortuitous that some person has a true belief—and it is usually called the ‘control’ condition. Very generally, it means that epistemic luck is independent of one’s control. Especially, according to Pritchard (2005) epistemic luck demands *total* independence of one’s control:

Another common way of characterizing luck is in terms of control, or rather the absence of it. If one were to say that, for example, “I discovered the buried treasure by luck,” one would be naturally understood as implying that one did nothing to ensure that one discovered what one did—that the discovery itself was out of one’s control in some way (Pritchard 2005: 127).

This “control” condition is not a new one. Almost the same can, in fact, be already found in Aristotle and Aquinas, when they teach what it means to state that the same event happens by chance:

Then, when he [Aristotle] says: It is manifest to me etc., he concludes from the foregoing that concerning the things are simply done for the sake of something, when they do not come to be the cause of what happened to him, but which are made for the sake of anything of external, then we say that they were made by chance (Saint Thomas Aquinas, *Commentaria: In libros Physicorum*, II, Lectio 10).³⁴

What exactly is Aquinas, together with Aristotle, saying here?

Let us consider an agent acting for an end. To say that an agent acts for an end is to say that both the agent and his activity have a determination that comes from that end; it is to say that both the agent and his activity tend toward that end. Now if the agent’s activity brings about an event to which he and the activity are not determined; if it brings about something end-like *that is outside the determination of himself and his activity*, we say the agent acted by chance; we say the agent and his activity produced a chance event (Junkersfeld 1945: 41, italic is ours).

As it can be seen, this passage summed up the same as the “control” condition invoked in the case of epistemic luck. But let us put epistemic luck aside and go back to coincidences.

Think about Monod’s example: Dr Brown is in control of *his* walk, he wants to go in a precise direction with a clear aim, that is visiting a patient. Some kind of control can be involved in one of the relevant causal trajectories. However, Mr Jones’ hammering is out of Brown’s control, since the two causal histories are

³⁴ «Deinde cum dicit: Quare manifestum est etc., concludit ex praemissis quod in iis quae simpliciter fiunt propter aliquid, quando non fiunt causa eius quod accidit, sed fiunt causa alicuius extrinseci, tunc dicimus quod fiunt a casu».

mutually independent. Therefore, a form of control is involved, but it is not a control that involves the entire intersection; it can be a kind of control regarding only *one* of the component causal trajectories. The intersection between Dr Brown's walk and Mr Jones's hammer is totally *outside the determination of* Dr Brown and *his activity*.

The "control" condition, on the basis of Monod's example above, can be refined in teleological terms: Dr Brown wants *only* to go to visit his patient and it is not his intention to meet Mr Jones' hammer; at the same way, Mr Jones wants just to fix the roof and it is not his intention to make the hammer fall down and hit the doctor's head. Dr Brown and Mr Jones both *do not* intend to produce the tragic accident which instead happens.

Similarly, in *Physics (Book II, 5, 196b33-197a6, 12–18)*, Aristotle offers an analysis of chance by means of the following example: a man wants to attain a precise end, that is to watch a play. Hence, he chooses to come to the marketplace, where the theatre is located. Then, he goes to the marketplace, where he unexpectedly encounters his debtor. Thus, he achieves an end *that is outside the determination of himself and his activity*: he collects on a debt. According to Aristotle, the man's encounter with the debtor is an outcome of chance, since a chain of causation which is aimed at a particular end, namely to attend a play, brings about an event that it is not intended to produce. In this example the teleological activity of the man who gets his money back is not intended to get the money back; likewise, the teleological activity of the debtor is not intended to pay the money back.³⁵

What about incompetent teleology?³⁶ Would a failure or success be a coincidence then? Suppose Mr Jones intends to drop a hammer on Dr Brown to kill him, but he is not ready in time. Then, in his scramble, he inadvertently kicks another hammer he had not noticed before (killing the doctor). Would this death be a coincidence then? Following Roderick Chisholm's account of agent-causation (see Chisholm 1966), we say that the answer is in the negative. Mr Jones has Dr Brown's life indirectly in power, that is there is a sequence of things $\langle p, \dots, s \rangle$ such that, starting from his bad intentions, he has p (i.e. his going up to the roof at a certain time) directly in his power, and he has s (i.e. the hammer hitting Dr Brown's head and killing him) indirectly in his power. Moreover, the event p is not caused by other events or states of affairs, but it is caused by the agent himself, who causes p in the endeavour to make s happen. So that the man, though by means of the wrong hammer, is responsible for the doctor's death. Suppose once again that Mr Jones intends to drop a hammer on Dr Brown to kill him, but he is not ready in time. Then, in his scramble, he inadvertently kicks another hammer he had not noticed before. Differently, this time that hammer does not hit and kill the doctor. Would this NON-death be a coincidence then? Following Chisholm's account, we say that the answer is positive. Mr Jones has no power at all in Dr Brown's NON-death: the event p (i.e. his going up to the roof at a certain time) is not caused by other events

³⁵ It is important to specify that, although the Aristotelian argument regarding chance is strictly related to the discussion concerning final causes and *τέλος*, this paper does not engage in a discussion about that.

³⁶ Thanks to an anonymous reviewer for raising this interesting point up.

or states of affairs, but it is caused by the agent himself. However, Mr Jones causes p in the endeavour to make the doctor's death happen, which does not happen instead. So that the man is not responsible for the doctor's NON-death. Those examples show once again how the absence of human contrivance is important to define coincidences.

Coincidences, intended as the result of the intersection between independent causal lines, are out of one's control and occur, in some sense, without human contrivance.

In summation, coincidences are as follows:

1. Unexpected—they respect the 'chance' condition
2. Relevant—they respect the 'significance' condition
3. Unplanned (not made by an act of the will)—they respect the 'control' condition
4. Fruits of the intersection between epistemically accessible independent causal lines—they respect the 'ontic independence' condition.

5 Conclusion

According to this account, coincidences are complex events for which no single constitutive component is sufficient to warrant their existence:

- Intersections between independent causal lines are necessary for coincidences but are not sufficient without their epistemic acknowledgment, our expectations, our attitudes toward them, and our plans.
- A minimal degree of epistemic access is necessary for coincidences but is not sufficient without the intersection of independent causal lines, as well as certain expectations, beliefs, attitudes, and plans.
- Expectations, beliefs, attitudes and plans are necessary for coincidences but are not sufficient without the intersection between independent causal lines and a certain kind of epistemic access.

The degree of epistemic access plays a very important role in identifying the independence between intersecting causal lines. Moreover, expectations, attitudes, and so on are necessary to define coincidences.

This rich view of the nature of coincidental events directly rules out conceptions like Monod's and Cournot's: strict objectivism about coincidences. The mental (i.e., epistemic and psychological conditions) and the ontic components are both necessary in determining a coincidence, but none is alone sufficient to really understand the nature of coincidences.

Acknowledgements We would like to thank many audiences who attended, and actively commented on, early presentations of this work and especially: people in Cagliari for the SIFA Graduate Conference 2013; people in L'Aquila for the SIFA2014 Conference; people in Port Elizabeth for the PSSA2015 Conference; people in Osnabrück for the GAP.9 Conference, and people in Pistoia for the SIFA2016 Conference. We would also like to thank an anonymous reviewer for this journal for valuable comments and suggestions.

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Funding Open access funding provided by Università degli Studi di Sassari within the CRUI-CARE Agreement.

References

- Aristotle, *Physics*. Book II
- Aristotle, *Metaphysics*. Book V
- Chisholm R (1966) Freedom and action. In: Lehrer K (ed) *Freedom and determinism*. Random House, New York, pp 11–44. Reprinted in Brand M (ed) (1970) *The nature of human action*. Scott Foresman and Company, Glenview, pp 283–292
- Cournot AA (1851) *Essai sur les Fondements de nos Connaissances et sur les Caractères de la Critique Philosophique*. Hachette, Paris
- Dennett DC (1987) *The intentional stance*. The MIT Press, Cambridge
- Engel M (2011) Epistemic luck. In: Fieser J, Dowden B (eds) *Internet encyclopedia of philosophy*. <http://www.iep.utm.edu/epi-luck/>
- Hand DJ (2014) The improbability principle: Why coincidences, miracles, and rare events happen every day. *Scientific American/Farrar, Straus and Giroux*, New York
- Hart H, Honoré A (1959) *Causation in the law*. Clarendon Press, Oxford
- Jacob P (2019) Intentionality. In: Zalta EN (ed) *The stanford encyclopedia of philosophy*. <https://plato.stanford.edu/entries/intentionality/>
- Junkersfeld MJ (1945) *The aristotelian-thomistic concept of chance*. University of Notre Dame, Notre Dame
- Lando T (2016) Coincidence and common cause. *Noûs* 51(1):132–151. <https://doi.org/10.1111/nous.12166>
- Laplace PS (1814) *Essai philosophique des probabilités*. Bachelier, Paris
- Melas A (2017) Cournot's notion of hasard: an objective conception of chance. *Axiomathes* 27(6):685–697. <https://doi.org/10.1007/s10516-017-9333-7>
- Monod J (1971) *Chance and necessity: essay on the natural philosophy of modern biology*. Vintage, New York [1970]
- Owens D (1992) *Causes and coincidences*. Cambridge University Press, Cambridge
- Pritchard D (2005) *Epistemic luck*. Oxford University Press, Oxford
- Putnam H (1981) *Reason, truth, history*. Cambridge University Press, Cambridge
- Quine WVO (1960) *Word and object*. The MIT Press, Cambridge
- Reichenbach H (1956) *The direction of time*. University of California Press, Berkeley
- Rorty R (1998) *Truth and progress*. *Philosophical papers vol III*. Cambridge University Press, Cambridge
- Saint Thomas Aquinas. *Commentaria: In libros Physicorum, II*
- Suppes P (1970) *A probabilistic theory of causality*. North-Holland Publishing, Amsterdam
- Varzi A (2005) *Ontologia*. Laterza, Roma-Bari
- Vidunas R (2019) Delegated causality of complex systems. *Axiomathes* 29:81–97. <https://doi.org/10.1007/s10516-018-9377-3>

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