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What Might a Theory of Causation Do for Sport?

Evan Thomas Knott

School of Humanities, The Department of Philosophy, The University of Glasgow, Glasgow G12 8LP, UK; e.knott.1@research.gla.ac.uk

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Abstract: The purpose of this research is to articulate how a theory of causation might be serviceable to a theory of sport. This article makes conceptual links between Bernard Suits' theory of game-playing, causation, and theories of causation. It justifies theories of causation while drawing on connections between sport and counterfactuals. It articulates the value of theories of causation while emphasizing possible limitations. A singularist theory of causation is found to be more broadly serviceable with particular regard to its analysis of sports.

Keywords: counterfactuals; absence causation; causal necessity; causal contingency; david kellogg lewis; prelusory goal; possible sport worlds; metaphysics of sport; causation in sport

1. Introduction

Stephen Mumford states, "Causation is what connects distinct phenomena. [David] Hume ... called it the cement of the universe .... [and] in sport, it is the absolutely vital metaphysical notion for without causation there could be no sport." [1]. Mumford asks, "What then is this metaphysical glue, which seems to bind one kind of event reliably with another and thus provides us with a basis for action?" [1]. Theories of causation are attempts to account for the basis. Two related questions will be answered: (1) What kind of theory of causation might be unifying in sport? (2) How would a theory of causation help to provide a theory of sport? This article answers the latter questions using Bernard Suits' definition of game-playing [2] and David Lewis' theory of causation[1] [6]. This article concludes that Lewis' theory is more broadly serviceable in answering these questions and that it offers valuable metaphysical import more generally. Lewis' approach belongs to a cluster of related theories known as difference-making approaches to the conceptual analysis of causation.[2]

2. Prelusory Goal and Causation

Why is the notion of a prelusory goal associated with causation? There is a link between Suits' definition of games and causation in sport. I will offer a conceptual analysis of this connection.[3] The analysis will support taking into consideration several theories of causation.

Suits looked closely at the elements of sports, by attempting to define games in contrast to Wittgenstein who took such definition to be impossible. There are reasons to think Suits was correct. Papineau recently stated that Suits provided " ... a wonderful account of games, and [I] shall raise no objection to it. Wittgenstein held that there is no set of necessary and sufficient conditions for being a game. I take Suits' account to refute him outright. It captures the essence of games perfectly." [8]. Yet,

[1] For a recent discussion on notable problems for Lewis' theory and possible solutions see Maar [3]. For a summary of common objections to Lewis' theory see Menzies [4]. For an argument on the general value of counterfactuals, including the association between counterfactuals and causation, and notable critiques of the latter connections see Nolan [5].
[2] For a technical critique of Lewis' difference-making approach see Menzies [7].
[3] I thank Reviewer 1 for their suggestions which helped focus the use of Suits' theory of game-playing.

there are any number of critiques of Suits' account, including Papineau's own response.[4] Moreover, on Suits' account of sports as games, "sport is the unnecessary attempt to overcome unnecessary obstacles" [8], or the voluntary attempt to overcome unnecessary obstacles to achieve some goal. Sport can be construed as a kind of goal-oriented activity. Suits first treats sports as simply that sub-class of games that involve physical skills and offers a definition of game-playing [8]. Suits later revised the view below, and yet sport remained a goal-oriented activity [15].

Theorem 1. *To play a game is to attempt to achieve a specific state of affairs [prelusory goal], using only means permitted by rules [lusory means], where the rules prohibit use of more efficient in favour of less efficient means [constitutive rules], and where the rules are accepted just because they make possible such activity [lusory attitude]* [8].

Upon further analysis, the participants of sports accept the rules, which function to permit or prohibit physical actions, which are oriented towards achieving the goal(s) of the sport. Yet, there are discussions in the literature about the possible need to break rules.[5] Furthermore, participants achieve the prelusory goal through physical means. Yet, exceptions apply where there is seemingly no prelusory goal.[6] That said, Suits' account is laden with causal concepts. Mumford notes, "The competitor in sport is aiming to cause some distinct outcome ... [and] aims to cause some event or state of affairs through their bodily movements ... " [1]. Furthermore, from a practical standpoint, rugby union uses the notion of materiality when analyzing, among other things, referee decision-making (e.g., Did Red 3's action(s) have a material effect on Blue 7?).[7] I take these latter points as good reasons for introducing several theories of causation for further consideration.[8]

Sports are goal-oriented. In addition, where events appear to repeat themselves, as they do in sports, there is an increased motivation to engage with imaginative exercises such as developing *alternative antecedent conditions* for the purpose of obtaining better future results [18]. Conceptually, thinking *counterfactually* can be associated with the prelusory goal. Moreover, the prelusory goal is an important notion in what follows, and I will use football as my primary illustration. The prelusory goal stated immediately below is not intended to be exhaustive, but it is sufficiently comprehensive enough for the purposes to follow. In football, the prelusory goal involves achieving a higher score than the opposing team. The prelusory goal is to direct the ball into the opponent's net while preventing the same on one's own net.

3. Theories of Causation

I have argued that Suits' account of sports as games employs causal concepts and that counterfactuals might interrelate. A theory of causation could then interrelate with Suits' account because causal concepts already do. A theory of causation that is apt at handling counterfactuals might add value by improving understanding of causal concepts employed in thinking about the prelusory goal. I will go on to argue that Lewis' theory has the potential to achieve the latter. Before doing so, I will note the causal theories on offer and the conceptual level of interest in what follows.

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[4] For an analysis of Suits' prelusory goal and lusory means, see Schneider [9]. For a response to Kreider's objections to formalism and non-formalism see Royce [10]. To understand how Suits' later work on play undermines the earlier definitional project of games, see Morgan [11]. For objections to Suits' notion of utopia as the ideal existence of game playing, see Thomson [12], Kretchmar [13], and Holowchak [14].

[5] See Royce [16] for a recent argument in favour of this position.

[6] See Hurka [17] for a discussion on the exceptions and Suits' revised account of games.

[7] I thank Reviewer 2 for this insight.

[8] If there is any doubt about the value of causation, Mumford also states, "Suppose there were no causation. Then anything could follow anything else. And then [for instance] when one kicks a football, instead of it moving in a direction roughly 180 degrees to the kick, it could do something else completely, such as evaporate. Or it might do nothing at all. Action [in sport] would then have no point. Its outcomes would be entirely unpredictable: and sport could not then be." [1].

An account of, approach to, or theory of causation involves defining, logicizing, modeling, or offering an explanation or understanding of causation. I am assuming that the theories of causation under discussion below are metaphysical apparatuses, conceptually engineered for various purposes some of which I have mentioned immediately above. My target is the conceptual level of analysis and assessing the merits of each theory in that respect. I am developing upon the cognitive aspects of causation and how theories of causation interrelate in understanding causation in sport.

In sum, sports can be conceived of as, among other things, causal activities, and a good theory of sport would capture that assumption or otherwise remain consistent with it. The best way forward when explicating causation involves referring to the developed theories of causation and then seeking out the possible value for sport. Moreover, offering an argument in favour of an elected theory of causation entails advocating the import of other metaphysical concepts. The same was true of causal concepts, which were implied in Suits' definition. There are three concepts that are associated with the recent and historical development of theories of causation. The three concepts are *causal necessity*, *causal contingency*, and *absent causes* or *omissions*. I will offer examples of each. If it is conceptually useful, such notions may also be referred to as *causal necessity in sport*, *causal contingency in sport*, *absent causes in sport*, and so on.

In cricket, when the batsman is caught out, but also knocks the bail off as they strike, it makes sense to refer to this as *causal overdetermination*: the player being out is overdetermined by more than one sufficient cause. This would be a token case of causal necessity. Likewise, it is reasonable to state: *had* there been one less cause, the player would still have been out. Moreover, in football, it is reasonable to construe a scored goal as causally contingent on a deliberate and preceding action of some player. If the player actually heads the ball into the net unfettered, the effect of scoring a goal is contingent on the player as the cause. One can appropriately ask, what if the player did not direct the ball into the net? It follows, the team would not have been awarded that particular goal.

The causal concepts employed above are analysable using counterfactuals. The "had" or "what if" are the kinds of alternative antecedent conditions that signal the use of counterfactuals in this context. By *counterfactual* or counter-to-the-actual in the context of this article, I mean something that did not happen. The counterfactual is introduced as an alternative antecedent to the actual world of events. Furthermore, the third concept is absence causation, and I propose that it is presently best understood using counterfactuals.[9] For example, had a referee exhibited better judgment (an absent cause), a particular goal would not have been scored.

Counterfactuals are normative in sports analyses. They are implied in sports commentary (e.g., Blue Team would have won if Blue 7 was not injured by Red 3), coaching strategy (e.g., Blue 7 would have scored that point on Red Team), reflections by athletes post-competition, and so on. In football, the use of the term missed opportunities implies a *what if* or *had* or counterfactual. Generally, if one is justified in assuming that counterfactuals are commonplace in sport, then one could be motivated to discipline those imaginings with an additional but relevant metaphysics suitable for analyses of sports, especially when the counterfactuals are associated with or directly concern causal claims. This is one sense in which a theory of causation might be serviceable to sport.

To analyse what any of the various theories of causation might do for sport, but which among them might be unifying, one first needs to understand the variants on offer; and what they might tell us about causation if anything. The standard approaches to causation include *generalist theories of causation* (e.g., the Regularity Theory or the RT), *singularist theories of causation* (e.g., Lewis' counterfactual theory of causation), *probabilistic theories of causation* (hereafter, *probabilistic approaches*), *causal process theories* (or *causal process approaches*), and *agency interventionist theories* (hereafter, *agency approaches*).

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[9] See Dowe [19] for an argument in favour of this position and see Mumford [20] for an opposing view.

4. Possible Limitations

I will begin by arguing that the agency, causal process, and probabilistic approaches are inadequate to the task of this article's aim. The purpose is to identify a possible unifying theory of causation for sport and one that best supports or connects with what was previously set out with Suits' definition. I will then explore how the RT and Lewis' account, which are often put in opposition to each other, might be useful. Moreover, there are two general problems raised for agency approaches, which are the anthropocentric problem and the issue of circularity. Before outlining why those are possible issues for applying agency approaches to sport, I will offer a definition of causation on this account:

Theorem 2. *If c causes e, then if c were to be manipulated in the right way, there would be an associated change in e* [21].

This approach addresses the associations between causes and effects through a mediating manipulation concept. In a more developed account, manipulation is characterized as an intervention. One concern is that this proposal excludes things that humans cannot manipulate. That general concern is not enough to rule the proposed definition out, because causation in sport involves human activities, and one can accept such anthropocentricism for intrinsically humanly defined activities. In addition, the more interesting causes in sport analyses will be of the manipulatable type.

The other concern is that an appeal to manipulation as a kind of causal concept to understand causation requires applying one kind of causal language to explicate another, i.e., there is epistemic circularity. A possible workaround might involve construing manipulation without causal concepts, and one such attempt involves introducing the further notion agency. In the revised view, an agent has implicit awareness of causes and their associated effects. If an athlete causes a goal, then if the athlete were to make such and such interventions on the ball, the ball would go in the net. However, further theoretical problems ensue. An athlete may be able to rely on their awareness of associations for localized interventions, but what about knock-on-effects or effects that are distant from their cause?

Suppose a basketball ball is thrown and bounces off the rim. How would agency play an explanatory role in subsequent bounces of the ball? One way of addressing these latter questions is to propose that an agent projects a similar agency to the basketball rim, which then supports the implicit awareness of causes and their associated effects [21]. Yet, is that proposal generally true of human nature or does it appear to project agency with an ad hoc basis? If the basketball ball happens to bounce predictably off the rim to the backboard, does a subsequent ball movement follow from a projected agency on to the backboard? This same question should be raised where the agent had made no intervention. Moreover, how could agency control for the confounding variables in the analysis of sports? For example, assuming that they are not the one doing the scoring, how does agency support knowing that Blue 7 causes Blue Team to score more often in light of the possible confounding variables?

One can raise concerns about how the agency approaches handle complicated cases of association between cause and effect. Does it then seem appropriate to rely on agency in causally complicated or even causally complex cases? The agency "approaches . . . [which] stress the connection between manipulation and causation [,] have been [most] popular within experimentally oriented disciplines . . . " [21]. Unlike the experimental context, sports cannot be re-run in a laboratory, to experimentally measure the possible causal relationships. Given that competitive sports lack the possibility of experimental objectivity, there is a prima facie reason that the agency approaches to causation are not going to be broadly serviceable to the goals of this essay. An agent will implicitly understand causation, but to what extent is that basis formally useful for the needs of sport analyses? I had proposed looking for a theory of causation that might be unifying and one that helps provide a theory of sport. In any case, an elected causal theory ought to accommodate or remain consistent with introducing alternative antecedent conditions in light of the analysis of Suits' account.

What might significantly matter in the quest for a potentially unifying theory of causation, is an account that supports counterfactuals, which takes one beyond the immediate actual world of events and causes. The latter implies the use of broader causal possibilities, which is supported by Lewis' approach. One of the virtues of Lewis' approach is that it could accommodate the exploration of possible worlds beyond the actual world of causes in sport—a kind of virtual understanding of causation. There is a motivation for this approach: Analyses will not be limited to accounting for the actual world of sport, but they will go beyond actual causation to absence causation. The latter associations are applicable to goal-oriented activities. Generally, it may be that the agency approaches are consistent with difference-making approaches to causation in sport, or that a particular agency approach and difference-making account can be combined in some hybrid model. I am not going to address the latter possibilities.

Before proceeding to probabilistic approaches, I will note that it is tenable that causal process approaches and some of the associated theories are reducible to one of the other theories of causation being discussed here. The general idea of a causal process approach is that any facts about causation as a relation between events obtain only on account of more basic facts about causal processes and interactions. Causal processes are the world-lines of objects, exhibiting some characteristic(s) essential for causation [22]. Therefore, causal processes and interactions are more fundamental than causal relations between events, and, " . . . [if] causation can be understood in terms of [these more basic] causal processes and interactions . . . [then] the 'appropriate relations' [which will be used to define them, will] tend to be counterfactual dependence, chance raising, or lawful sequence . . . " [22]. In terms of what has been stated in this article thus far, counterfactual dependence is captured by Lewis' approach, and the notion of chance raising by some suitable probabilistic approach, and lawful sequence by the RT. Moreover, one of the important accounts associated with causal process approaches is Wesley Salmon's mechanistic approach [23], which takes "[a] causal processes [as having] the capacity to transmit marks, namely various sorts of signals or information." [22]. However, Salmon abandons all probability, and the account fails to accommodate absent causes [22], which are normative and explanatory, as previously shown above. How can there "be [actual] mechanisms linking non-existent [or non-actual] entities [?]" [22]. For example, the absence of a key player Blue 7 could be viewed as explanatorily useful for assessing a win or a loss for Red Team or Blue Team. Yet, in Salmon's account, there is no mechanism that links the non-existent causes to the actual events.

A probabilistic approach would be useful for informing analyses of some kinds of causes or perhaps even identifying or realizing specific causes. In addition, I am not proposing the desertion of mechanistic or probabilistic theories of causation, which, when successfully applied to sport, would obviously be serviceable to understanding aspects of causation in sport. Yet, probabilistic accounts suffer from an obvious shortcoming. A probabilistic account of causation can be stated as follows:

Theorem 3. *Probabilistic Dependencies—normally when c causes e the former raises or lowers the probability of the latter* [24].

In other words, causes raise or lower the probability of their effects. Yet, the general concern for invoking probabilities alone applies to sport. Let us assume the following: *Some C's raise the probability of E's*. For instance, some kinds of players would seemingly raise the probability of their team scoring points. There will be instances or counterexamples where the same kinds of players lower the probability of the same team scoring. Without the underlying and accompanying mechanism spelled out for possibilities, probability says nothing about what we take to be the actual cause of the points scored. If Blue 7 raises the probability of their team scoring, then *why*? There are cases where one wants more than probabilistic statements. Notably, "probabilistic theories [ultimately] flounder because they admit counterexamples and because they fail to accommodate the important connection between causality and physical mechanisms." [24]. In addition, it is safe to state that, "an account that seeks to characterize or analyse causality just in terms of probabilistic dependencies, or just in terms

of physical mechanisms, will be inadequate." [24]. More is needed for each account or perhaps the theoretical approaches can be combined in some other way.

One solution to the theoretical conflicts that arise between competing accounts of causation might be to adopt some kind of pluralist view of causal theories or even to abandon all reference between theories of causation and the actual world itself [25]. The assumption that there is no actual correspondence, between any of the theories of causation and the world, may dissolve some conflicts about which theory best accounts for the causal nature of some target phenomena. Yet, any radical proposal could raise further philosophical grievances and concerns, likely exasperate theoretical issues, and/or may simply lead to a generally impoverished metaphysics about causes in sport.

5. The Value of Difference-Making Approaches to Causation in Sport

David Lewis provided a kind of singularist theory of causation broad enough that it could be applicable to sport. Articulating the use of Lewis' approach to the analysis of causes in sport entails advocating that adherents to that view become counterfactualists in a much stronger sense than that in which they might already be. By *counterfactualist*, I mean that one believes that knowledge can be derived from counterfactual thinking. In the sense being discussed here, that knowledge concerns causation in sport. Lewis initially defines causation with the associated counterfactual dependence as follows:

Theorem 4. *Where c and e are two distinct possible events, e causally depends on c if and only if, if c were to occur e would occur; and if c were not to occur e would not occur* [4].

On the assumption that counterfactual thinking is already employed in sport, I argue for the application of Lewis' approach, which entails structuring those assumed imaginings. I argue that Lewis' approach might be unifying for sport, in so far as counterfactuals, which interrelate with absent causes, can be broadly utilized in thought experiments for the analyses of sports.

Concerning the two remaining theories yet discussed, they are sometimes set up in contention. The Humean generalist theory of causation (the RT) can be taken to be at odds with the Lewisian singular theory of causation. I am not supposing that they are ultimately irreconcilable. Conceptually, it is practical to apply the notion of law-like regularities to sport, and specifically, to instances that could be spelled out in terms of physical laws. For instance, projectile motions in sport are captured or understood through physical laws. Yet, not everything causal in the analysis of sport will be captured by the generalist's account, which is a requirement of the RT.

The issue I will dwell on concerns the impracticality of the RT's broad application to sport. When attempting to vindicate the invariant use of a generalist theory of causation for sport, there will be difficulties fitting all cases of causation into the logic of the generalist framework, which states: *All A's are B's*.[10] It simply is not the case that all causation in sport can be put in this form. For the RT, all instances of causation in sport would need to be invariant in the sense that B-events necessarily, or always follow, or are constantly associated with, or conjoined with A-events as follows:

Theorem 5. *c causes e if and only if it is the case that c temporally precedes e, and all type-C events are always followed by Type-E events* [3].

Let us test the generalist's model with an example. Take, for instance, George Weah's 1996 goal against Verona. Under the RT, one would have to look at other instances of goals to know if George Weah caused the specific goal. There are instances of causation where generally similar events should be irrelevant. It would be useful to make this distinction broadly clear ontologically because what

[10] In this context, either A-events and C-events or B-events and E-events are equivalent notations.

value a generalist theory of causation does not offer in understanding causes in sport is important for identifying what a singularist theory of causation might be able to do for sport more generally.

One can think of the world of sports as a subset of the social world, all of which is a subset of the physical world. However, just because a generalist theory can be seen to, conceptually speaking, range over all of these sets (e.g., physical laws apply to all sets) it does not follow that a generalist theory can do all the conceptual work related to all instances of causation among the sets. This leaves open a conceptual space for Lewis' theory to be serviceable. This is another way to state that more causal theories are needed than the RT. Moreover, if the RT could account for all instances of causation, then counterfactuals could still be supported by such laws. A physical law can be used to predict or explain what-if such and such happened as much as it explains what actually happens. Conceptually, one can imagine building out possible worlds based on full knowledge of the physical laws as they pertain to sport and all relevant levels of analyses of the sets. Yet, one cannot presently achieve the latter, epistemically speaking, or for other reasons it might not be possible, which again creates a space for a singularist theory of causation to offer understanding and insight.

In the application of Lewis' account to follow, I would characterize the inquiry as targeting the individual and/or collective level of analysis of causation in sport. At that conceptual level, there are complex features, which are not, at this present state of knowledge, immediately amenable to the RT's interpretation of causation. We cannot apply physical laws to account for all or even most of these features of sport. In addition, one may try to utilize robust tendencies from psychology or sociology (e.g., social laws), but even the best examples of propensities do not fit the RT's *All A's are B's* formulation. A statistical law takes the form *Some portion of A's are B's*, which is not typically if ever understood as causation. Moreover, there would be in retrospect of many professional sporting events, an attempt to identify causes that have more weight or bearing on a specific win or loss. Yet, conceivably, such analyses would not be carried out using general causation. Understanding causation in this latter sense is more amenable to Lewis' theory, but in particular with respect to absence causation.

A straightforward way to introduce absent causes into causal analyses is either as *causation by prevention*, *causation by double-prevention*, or *causation by omission* [26].[11] I will focus exclusively on the latter. I will suppose the following case of omission: *c actually causes e; but, if a happens, then e does not.* What is implicit in this case of omission, and makes for an additional cause of *e* (conceptually) is the counterfactual: *had a happened, it would have or might have prevented e*. Under a deterministic framing, the reading would be: *had a happened, it would have necessarily prevented e*.

These formulations might be viewed as problematic for a natural ontology, which supposes some correspondence with the actual world's nature, but they are not problematic in that one sense, in so far as they are assumed in a thought experiment. A counterfactual thought experiment, about an alternative sport scenario or outcome, is not bound to actuality, but it can engage with a variety of causal possibilities, of which, absence causation is an example. The appropriateness of a supposed thought experiment is a notable concern, and specifically whether it is disciplined, reasonable, or otherwise satisfies as a good, rational, but not too speculative reconstruction of the sport, which is supported by the right facts in the right way. From the standpoint of a skilled analyser of sport, a thought experiment can yield better and more accurate conclusions about the reasonable possibilities one can appropriately conjecture using counterfactuals.

For instance, it is safe to say that good professional-level coaching will involve evaluating the wins and losses (especially the losses) by thinking about what might or what would have been the case if the relevant causes had been different. One way that these counterfactual analyses could proceed involves adding possible causes and then imagining the possible effects of achieving the prelusory goal. A similar strategy could be to subtract actual causes away and then likewise imagine the outcomes.

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[11] Both *causation by prevention* and *causation by double-prevention* are kinds of *causation by omission* for Paul [26]. Paul also uses the notion of *causation by omission* to refer to a specific instance [26], which is how I am using the terms.

Yet, absent causes are not necessarily part of the actual world of events. However, they can be made relevant to analysis. If I am late for work, a normative explanation could be that my bus never arrived. The omitted cause is the bus. Likewise, if Blue Team lost the game, it could be explained by the absence of the key player Blue 7. An explanation is not necessarily limited to the actual gameplay.

For illustrative purposes in football, let us suppose the following case: the referee actually causes the loss of the game for Orange Team, because of a decision that benefits Green Team. Let us further suppose that the decision is a bad call and also leads to a successful penalty kick. If it is helpful, let us suppose that this is the World Cup, where penalty kicks more often end in success. This is a sample case where poor judgment explains the loss of the game for Orange Team. Let us assume it is reasonable to speculate that the following holds true at the end of the game: had a member of Orange Team not been called for a penalty, which caused a subsequent penalty kick, then consequently, the winning goal would not have been scored by a member of Green Team. The actual goal is not guaranteed before it happens, but if it does occur, the referee's poor judgment will be seen as the cause of the unwarranted opportunity.

Continuing this line of thought, the absent cause can be straightforwardly identified. The referee is normally expected to make reasonable and accurate judgments and not to inappropriately award advantages. The referee fails to do the latter, and another way of re-stating the latter is to express that good decision making by the referee can help a team win the game, and in its absence, bad judgment can cause, determine, or contribute notably to a loss. One could also state, in a stricter analysis that remains closest to the actual world of causes, that only a bad decision caused the match to be lost, full stop. However, the latter construal overlooks the associated analysis for obtaining the prelusory goal.

To achieve the prelusory goal in reflection, one needs to import the cause *good decision making* to form the relevant thought experiment, i.e., the relevant absent cause has explanatory significance in light of the prelusory goal. In this sense, the counterfactual is a kind of conceptual go-between, which allows assessment of the factors that determine whether one team achieves or fails to achieve certain ends when conceptualizing causes aimed at achieving the prelusory goal. The referee's decisions can be seen as the more weighty cause in the penalty kick scenario.

In the illustration above, the cause, which is the false perception of a foul is actually present with its effect which is the loss of the game. The relevant counterfactual, more simply stated, is as follows: Had good judgment been the case (*a*), the Green Team's winning that particular win would have been prevented (*e*)—*no bad call, no-win* (or not that specific win). This singular cause is taken to be more essential among the various causes one could elect to explore. One might object that bad calls are just part of the game. Assuming that this is so, let us explore another nearby world in light of that view.

Another way of construing things from above is to state that, what it takes to win a football match, is not to elicit false judgments by referees at a critical time. If so, the player's ability to not do something is also part of the actual causal landscape with respect to the prelusory goal. Again, the cause could be stated non-counterfactually: a member of Orange Team exhibited poor judgment, causing a false perception by the referee, thus causing the loss of the game for their team. Yet, in retrospect of the actual loss, one must subtract away the actual cause *bad judgment*, and make it absent, in order to reconstruct events more favourably. The richer explanation involves a counterfactual anyway. There are two plausible counterfactual readings for the absence of good decision making, in Lewis' account, where I take Proposition 1 to be the more appropriate construal based on Suits' lusory means:

Proposition 1. Where *the referee's bad decision (c)* and *the winning goal (e)* are two distinct possible events, e causally depends on c if and only if, if c were to occur e would occur; and if c were not to occur e would not occur.

Proposition 2. Where *the player's bad decision (c)* and *the winning goal (e)* are two distinct possible events, e causally depends on c if and only if, if c were to occur e would occur; and if c were not to occur e would not occur.

What is important to address at this juncture of the counterfactual analysis is further thought that Orange Team could have just lost the game anyway. However, in contrast to guaranteeing a win, a particular loss is connected with a particular referee's bad decision. In a different possible world where the referee makes a normatively good call, events can still unfold unfavourably for Orange Team. However, in the thought experiment above, I have assumed an illustrative case that constrains the possible variables. My point in doing so was to provide a clear example, and a contrastive view to the RT, rather than to oversimplify sports more generally. In short, where the referee makes the same bad call, and Green Team goes on to win anyway by some other means, a different *possible sport world* from the one I have stipulated above is being employed.

The RT, as is, would lead to an impoverished analysis. Lewis' singularist theory of causation is more amenable to the evaluation of causes in sports. Lewis' theory is apt at handling absent causes, which can be made important for understanding the events that precede the wins or losses of games. In most conceptually developed sports, such as football, which I assume here as a paradigm case, the analyser of events will also want to understand the larger terrain of causation, in light of the prelusory goal or just because sport is goal-oriented.

Generalizing, for a theory of causation to be serviceable to the conceptual analysis of sport, it should accommodate counterfactuals in the senses discussed above or remain consistent with that possible normative use. In contrast to the view being advocated, a dispositionalist's view maintains that "[the] regularity theory and the counterfactual theory are judged merely to describe phenomena that follow from real causal connections. They are attempts to avoid acknowledging the reality of causal necessity [20]." Importantly, there are no contenders that provide an alternative to Lewis' theory, although the *causal modelling approach* does seek to formalize it by " ... establish[ing] interconnections between causal relationships on the one hand, and regularities, counterfactuals, interventions, and probabilities on the other ... " [27]. This approach links theorems and may be applicable to sport. Moreover, Lewis' theory has the potential to be unifying in sport, not only because it can support absent causes, and how the latter can be shown to conceptually function in thought experiments with respect to the prelusory goal, but because Lewis' theory can support the analysis of singular causation more generally. Moreover, Lewis' metaphysics assumes law-like regularities or laws of nature as the basis of a possible world [6], and the revised theory is consistent with the use of probabilities [28]. Lewis' view can accommodate many types of causal claims that may be used in sport. Last, Lewis' more developed account bears some resemblance to Salmon's approach, where "Causation as a pattern of influence is similar to the idea that a causal process entails transmitting a mark." [3]. Lewis later defines the pattern of influence as follows:

Theorem 6. *Where* c *and* e *are distinct events,* c *influences* e *if and only if there is a substantial range of* c1, c2, ... *of different not-too-distant alterations of* c *(including the actual alteration of* c*) and there is a range of* e1, e2, ... *of alterations of* e*, at least some of which differ, such that if* c1 *had occurred,* e1 *would have occurred, and if* c2 *had occurred, e2 would have occurred, and so on* [4].

In the revised account, Lewis' establishes a "pattern of counterfactual dependence of whether, when, and how on whether, when, and how (. . .) C causes E ... [if and only if] there is a chain of stepwise influence from C to E." [3]. In addition, "under this amendment[,] we are in [a] good position to say that there are different degrees of causal influence ... " [3]. which is likewise serviceable to analysis in sport. Lewis claimed that the revised theory was better at handling specific cases of pre-emption [4]. For example, suppose that there is a well-placed corner kick and two teammates happen to both be in a scoring position such that if one misses the goal another would have scored. Lewis' original theory cannot explain the judgment that the first player was the actual cause of the goal. There is no dependence between the player and their goal since if they missed heading the ball in the net, the goal would have been scored anyway. In other words, there is no counterfactual dependence for defining the causal relationship between the player and the goal that they are causally responsible

for. In the revised theory, if the first player's physical actions are slightly different (e.g., the ball is a little higher and their position is different) while holding fixed the second player's physical actions, we find that the goal is different too. However, if we make similar alternations to the second player's physical actions while holding the first player's fixed, we find the goal is the same. The dependence between the player and their goal is more well defined in Lewis' revised account.

6. Conclusions

Mumford states, "Sport typically involves notions of winning and losing, based on some comparative measure: [for instance,] who scored more goals ... [and it] ... makes sense to reward winners ... on the ground[s] that ... [they] are causally responsible for the outcomes that are produced. Hence, the goal scorer is congratulated only because they caused the goal ... " [1]. Causation is relevant to sport and several theories of causation are shown to be connected with the analyses of sports. However, the Regularity Theory requires a problematic construal of many instances of causation in sport. Yet, associating causation with counterfactuals and embedding that proposal in an appropriate singularist theory of causation is broadly serviceable to sport. One theoretical upshot of Lewis' counterfactual theory of causation is made clear. Lewis' theory is particularly apt at handling absence causation, which is shown to play a useful role in the analyses of sports. In such analyses, counterfactuals support a kind of virtual understanding of causation by allowing for engagement with a larger conceptual space of possible causes in sport. Engaging with a broader conceptual space has practical application in planning for as many events as possible including non-events, and for good practices regarding player development and team preparation.[12] In addition, as this article can improve understanding of causal responsibility it might support new insights into the debate about the role of chance in sport.[13] Some might think it is better to be prepared than lucky. In player evaluation, it is useful to know whether success is attributed more to chance or causal responsibility. In addition, causation in sport is interlinked with philosophical views on bodily movement in sports.[14] Hence, further insights might be supported in the latter area of sport philosophy. Last, concerns over risks, dangers, safety [32], and injuries in sport are all possible candidates for counterfactual analyses.

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References

1. Mumford, S. Metaphysics and Sport. In *Routledge Handbook of Philosophy of Sport*; Routledge: New York, NY, USA, 2015.
2. Suits, B. *The Grasshopper: Games, Life, and Utopia*; University of Toronto Press: Toronto, ON, Canada, 1978; p. 41.
3. Maar, A.; Applying, D.K. Lewis's Counterfactual Theory of Causation to the Philosophy of Historiography. *J. Philos. Hist.* **2016**, *10*, 349–369. [CrossRef]
4. Counterfactual Theories of Causation. Stanford Encyclopedia of Philosophy [Online]. 2014. Available online: https://plato.stanford.edu/entries/causation-counterfactual/ (accessed on 15 April 2019).

[12] I thank Reviewer 2 for their insights as an active rugby union coach and former match official.
[13] See Breivik [29] and De Wachter [30] for opposing views on chance in sport.
[14] See Breivik [31] on the philosophy of bodily movement in sport.

5. Nolan, D. Why historians (and everyone else) should care about counterfactuals. *Philos. Stud. Int. J. Philos. Anal. Tradit.* **2013**, *163*, 317–335. [CrossRef]
6. David, L. Stanford Encyclopedia of Philosophy [Online]. 2014. Available online: https://plato.stanford.edu/entries/david-lewis/#5.1 (accessed on 25 April 2019).
7. Menzies, P. Difference-making in context. In *Causation and Counterfactuals*; The MIT Press: Cambridge, MA, USA, 2004.
8. Papineau, D. The Nature and Value of Sport. In *Games, Sports and Play: Philosophical Essays*; Oxford University Press: Oxford, UK, 2019; pp. 194–195.
9. Schneider, A.J.; Butcher, R.B. Pre-lusory Goals for Games: A Gambit Declined. *J. Philos. Sport* **1997**, *24*, 38–46. [CrossRef]
10. Royce, R. Game-players and game-playing: A response to Kreider. *J. Philos. Sport* **2012**, *40*, 225–239. [CrossRef]
11. Morgan, W.J. Some Further Words on Suits on Play. *J. Philos. Sport* **2008**, *35*, 120–141. [CrossRef]
12. Thomson, K. Sport and Utopia. *J. Philos. Sport* **2004**, *31*, 60–63. [CrossRef]
13. Kretchmar, S.R. The Intelligibility of Suits's Utopia: The View from Anthropological Philosophy. *J. Philos. Sport* **2006**, *33*, 67–77. [CrossRef]
14. Holowchak, A.M. Games as Pastimes in Suits's Utopia: Meaningful Living and the "Metaphysics of Leisure". *J. Philos. Sport* **2007**, *34*, 88–96. [CrossRef]
15. Suits, B. Tricky Triad: Games, Play and Sport. *J. Philos. Sport* **2012**, *15*, 1–9. [CrossRef]
16. Royce, R. Concerning a moral duty to cheat in games. *J. Philos. Sport* **2015**, *42*, 317–325. [CrossRef]
17. Hurka, T. On Judged Sports. *J. Sport Ethics Philos.* **2012**, *6*, 323–335. [CrossRef]
18. Markman, D.; Gavanksi, I.; Sherman, S.; McMullen, M. The Mental Simulation of Better and Worse Possible Worlds. *J. Experimen. Soc. Psychol.* **1993**, *29*, 87–109. [CrossRef]
19. Dowe, P. Absences, Possible Causation, and the Problem of Non-Locality. *Monist* **2009**, *92*, 23–40. [CrossRef]
20. Mumford, S. Causal Powers and Capacities. In *The Oxford Handbook of Causation*; Oxford University Press: Oxford, UK, 2009.
21. Woodward, J.F. Agency and Interventionist Theories. In *The Oxford Handbook of Causation*; Oxford University Press: Oxford, UK, 2009.
22. Dowe, P. Causal Process Theories. In *The Oxford Handbook of Causation*; Oxford University Press: Oxford, UK, 2009.
23. Wesley, S. Stanford Encyclopedia of Philosophy [Online]. 2018. Available online: https://plato.stanford.edu/entries/wesley-salmon/#CausProc (accessed on 25 April 2019).
24. Williamson, J. Probabilistic Theories. In *The Oxford Handbook of Causation*; Oxford University Press: Oxford, UK, 2009.
25. Beebee, H.; Hitchcock, C.; Menzies, P. *The Oxford Handbook of Causation*; Oxford University Press: Oxford, UK, 2009.
26. Paul, L.A.; Hall, N. *Causation: A User's Guide*; Oxford University Press: Oxford, UK, 2013; pp. 173–175.
27. Hitchcock, C. Causal Modelling. In *The Oxford Handbook of Causation*; Oxford University Press: Oxford, UK, 2009.
28. Interpretations of Probability. Stanford Encyclopedia of Philosophy [Online]. 2014. Available online: https://plato.stanford.edu/entries/probability-interpret/ (accessed on 25 April 2019).
29. Breivik, G. Against chance: A causal theory of winning in sport. In *Values in Sport: Elitism, Nationalism, Gender Equality and the Scientific Manufacturing of Winners*; Taylor & Francie: London, UK, 2009.
30. De Wachter, F. In Praise of Chance: A Philosophical Analysis of the Element of Chance in Sports. *J. Sport Ethics Philos.* **2012**, *12*, 52–61. [CrossRef]
31. Breivik, G. Bodily Movement—The fundamental dimensions. *J. Sport Ethics Philos.* **2008**, *2*, 337–352. [CrossRef]
32. Ryall, E. What is the value of dangerous sport? In *Philosophy of Sport Issues and Ideas*; Bloomsbury: London, UK, 2016.