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The ontology of videogames

Alexandre Declos

(University of Neuchatel)

Abstract: What are the identity and persistence conditions of videogames? This paper surveys the contemporary philosophical literature on this topic. Specifically, I discuss various views which attempt to ground the identity of videogame works in their rules, in their algorithmic structure, in their source code, or in contextual parameters surrounding gameplay. While these proposals all have merits of their own, I argue that none of them are satisfactory. My conclusion is therefore negative: we still lack an adequate theoretical model to account for the identity and persistence conditions of videogames.

Keywords: videogames, ontology, identity, rules

Introduction

The ontology of videogames is a relatively recent but rapidly growing field of study that explores issues related to the nature and identity of videogames. Consider *Elden Ring*, the latest critically acclaimed videogame released by From Software —the studio behind the iconic *Dark Souls* series. That videogame has many noteworthy features: a beautiful and immense open world, a haunting soundtrack, a narrative of quest and discovery, and so on. One of the central tasks of videogame ontology is to determine how these aspects contribute to the identity of *Elden Ring* as a videogame. In other words: what makes *Elden Ring* the videogame that it is? On what grounds do we differentiate it from other videogames, such as *Super Mario World* or *Dark Souls*? What explains that particular playings of *Elden Ring*, even when they exemplify notable differences, are still considered playings of the *same* videogame? Would the identity of *Elden Ring* be affected if it were played on an arcade machine, if its game engine or soundtrack were entirely rewritten, or if new playable content were added to the game?

The aim of this paper is to address such ontological issues about the identity of videogames. After a number of introductory remarks (section 1), I survey several extant views which attempt to provide identity criteria for videogame works: rule-based accounts (section 2), the algorithmic ontology (section 3), code theory (section 4), and contextualism (section 5). I argue that while these rival views all have merits of their own, none is satisfactory in its current form. My conclusion is that we still lack an adequate theoretical model to account for the identity conditions for videogames.

1. Preliminary remarks

Ontological debates on the identity of videogames revolve around two related but distinct issues. The first is their *individuation conditions*: at which necessary and sufficient conditions are x and y (instances of) the *same* videogame? This question arises when we consider what makes *Elden Ring* the work that it is, why it differs from other videogames, or why very different playings of that game nevertheless remain playings of the same videogame. The second issue is the *persistence*

conditions of videogames: when do these digital artifacts come into being or cease to exist? What kind of change, if any, can they survive? For instance, would *Elden Ring* survive the removal of such or such gameplay mechanic or graphical asset?

I shall examine below how these two issues have been addressed in the recent philosophical literature. But first, a few clarifications are in order.

First, it should be stressed that videogames, and indeed all sorts of games, seem to have identity conditions. We can usually tell what counts as the same videogame. You don't have to be a hardcore gamer to know (indeed, to see) that *Street Fighter IV* is not the same videogame as *SoulCalibur VI*. In addition, all gamers would readily assent that adding a new skin for Chun-Li in *Street Fighter IV* does not really impact its identity as a videogame, while replacing all the playable characters with Pokémon certainly would. *Something* must ground these intuitions. Saying what does exactly is the question that videogame ontologists try to answer.

Second, it's crucial to recognize that these ontological concerns have significant practical implications. For instance, deciding what counts as cheating or fair play arguably requires ~~to have~~ a certain notion of the identity of the game being played (Bartel 2018, p. 10). Someone who protests that a certain move is illegal might be suggesting that their opponent is not playing exactly the *same game* as they are. Likewise, copyright issues would hardly make sense in the absence of an ontological bedrock. Without an understanding of the conditions under which two artifacts just are the same videogame, close variants, or entirely different works, disputes surrounding intellectual property and plagiarism would be intractable. In brief, ontological matters matter: an ontology of videogames will clearly have tangible real-world implications.

Third, videogames evidently are repeatable entities or "multiple" works, just as photographs, novels, or rock albums. The various physical or digital copies of *Bloodborne*, e.g., are all genuine instances of the same videogame work. That relationship can be clarified using the familiar type/token distinction. A token is a particular instance or realization of a more general type. For instance, even if each particular playing of *Bloodborne* is a distinct token-event, each remains an instance of a more general type. Likewise, each physical or digital copy of *Bloodborne* is a token exemplar of the same work type. The issue I am interested in here, framed in terms of this distinction, is to provide a criterion of identity for videogame types. The individuation problem is that of explaining what makes various tokens (whether exemplars or playings) tokens of the same videogame type. The persistence issue is that of knowing what is required to create or destroy a videogame type, or again, what kind of change a given type can undergo without ceasing to qualify as the same work type.

It should be noted, lastly, that the interactivity of games gives rise to an ontological puzzle. In games and other strongly interactive works, "the structure [of the work] itself is shaped by the interactor's choices" (Lopes 2001, p. 68). In videogames such as *Minecraft* or *Red Dead Redemption 2*, players are free to engage in a host of in-game activities in the order of their choice. As a result, each playing will be practically unique in terms of the fictional actions and events depicted on the screen. But then, on what grounds can we still see them as playings of the *same* game? The problem is the following:

> In the case of mass art works like films, the type/token relationship functions because tokens share an artistic structure because they are tokens of that type. But given the extensive variation seen in videogames, through their audio-visual presentations and the nature of fictional events thus depicted, there does

not seem to be a single artistic structure shared between all instances (Tavinor 2011).

The challenge is to reconcile this apparent lack of "shared structure" between individual playings with the common belief that these playings are nevertheless instances of the *same* work. This belief is central in our appreciative practices: we value games not only for the particular qualities exhibited in specific playings, but also for the possibilities they offer, or "the range of instances [they] generate" (Tavinor 2011; see also Lopes 2010, p. 94). As such, a central challenge of videogame ontology is to make sense of the identity of videogame types in light of the considerable variation of their tokens, that results from the strongly interactive nature of the medium.

In brief, an adequate ontology of videogames ought to answer both the individuation and the persistence questions. Of course, different methodologies are available here. One may take the descriptive road, unearthing and systematizing the ontological assumptions implicit in our common gaming beliefs or practices. Alternatively, one might argue that these ordinary beliefs are confused or ultimately irrelevant. This revisionary path would advocate revising our beliefs as advised by our best ontology of videogames. I will not dwell on these methodological considerations here and shall simply assume that, all else being equal, the theory which accommodates most of our pretheoretical beliefs about games should be preferred.[1]

2. Rule-based accounts

A first and popular family of views proposes to ground the identity of (video)games in their *rules*. Consider chess. Some aspects of that game seem inconsequential to its identity, such as the shape or size of the pieces, or the medium in which the game is played (which can either be physical, digital, or even mental). The same, however, does not apply to the rules of chess, which govern the number and type of pieces in play and their legal moves. It is plausible to think that this rule-set is what *defines* chess, demarcating it from other actual or possible games. Generalizing this intuition, one could be tempted to consider that "every game *is* its rules" (Parlett, 1991, p. 3). On this view, videogames would be individuated by their rules, broadly construed to encompass legal moves, objectives, affordances, etc. Token artifacts would be instances of the same game type whenever they are associated with the same rule-set, and individual playings would count as tokens of the same (video)game type as long as they are produced by interactions with the same rule-set. This is what I call the Simple Rule Account (SRA):

> (**SRA**): x and y are instances of the same (video)game type iff x and y are produced by interactions with (and comply to) the same rules.

SRA has several advantages. First, it offers an individuation criterion not merely for *video*games, but more generally for all sorts of games (boardgames, tabletop RPGs, etc.). Second, SRA seems capable of accounting for "transmedial" games, such as chess or *Sudoku*, which can migrate from a physical medium to a digital one (or vice versa) while supposedly remaining the same game type.[2] Because rules can be characterized functionally, SRA seems well-positioned to explain why the same game type can be implemented in different media (see however Bartel 2018). Lastly, SRA has no trouble explaining the qualitative variation found in different playings of a given game, from tic-tac-toe and baseball to *World of Warcraft*. The same rule-set can yield a number of very different game states (again, just think of chess). Thus, two players play the same game as long as their playings comply to the same rules, regardless of any other differences.

[1] See Thomasson (2004) for a parallel discussion on how the ontology of art ought to proceed *vis-à-vis* common sense beliefs.
[2] See Juul (2005) and Bartel (2018).

Despite these merits, SRA faces a number of substantive issues, including the following.

The Capman problem. A first difficulty with SRA can be illustrated with a thought experiment.[3] Imagine that someone creates *Capman*, a videogame with rules and mechanics exactly the same as *Pacman*, but with the following twists. In *Capman*, your avatar isn't a yellow blob, but a pixelized Donald Trump. The little dots paving the maze are replaced by dollar bills, and the colored ghosts by FBI agents. Now the problem is this: is *Capman* the same videogame as *Pacman*? This isn't just an armchair metaphysical concern. Depending on how we answer, the creator of *Capman* might end up being accused of copyright infringement. Since these two videogames share the same rules, SRA must say that they are instances of the same work type. Just as there are many versions of *Monopoly* which merely diverge in their surface and aesthetic aspects —a marketing ploy that allows manufacturers to re-sell the same game over and over—, *Pacman* and *Capman* are the same videogame type, with a different gloss or "skin".

That conclusion seems unacceptable, however. The issue isn't merely that the visual appearance of both games significantly differs. They also have different categorial and aesthetic properties. *Capman*, but not *Pacman*, is a political satire or perhaps a serious game. It exemplifies sarcasm and subversion, while *Pacman* does not. The two artifacts will also produce very different experiences and appreciations among users. Unless we are prepared to deny any ontological weight to the "experiential" layer of games —more on this later—, it is implausible to say that the two videogames are instances of the same videogame type; that they are strictly speaking *the same game*. Yet, SRA is forced to that conclusion. This is a strong reason to reject that view.

Rule change. A second concern is that SRA implies that every and any change of rules counts as the creation of a new and distinct game type. This seems incredible, since we ordinarily assume that a game can survive at least some rule changes. Games, after all, constantly evolve. In 2014, FIDE (the International Chess Federation) introduced the new rule of "fivefold repetition", stipulating that the game immediately ends in a draw if the same position occurs five times. While this is a rule change, no one saw it as the replacement of what was previously known as chess by an eponymous but altogether different game. This point extends to videogames, which are now regularly updated through patches after their release. Patches frequently involve rule changes and hence, by SRA's logic, changes in videogame type. Gamers, however, do not tend to consider that patches (or at any rate, not *all* of them) have such a consequence. In brief, the issue is that SRA seems to deliver incorrect persistence conditions for (video)game types, in asserting that the rule-set associated to a game could not survive any alteration whatsoever.

The 'overly reductive' objection. A third and final issue with SRA is that videogames are not solely made up of rules. They also contain a number of building blocks, such as textures, sprites, scripts, or sound effects. These elements aren't rules in any ordinary sense, and thus, aren't taken into account by SRA. As a result, this view sees the representational, audio, and narrative aspects of videogames as entirely irrelevant from an ontological perspective. But when we play, what we see, hear, and read matters a great deal. These surface elements cannot be considered a superficial gloss, inconsequential to the identity of the artifact we are interacting with.[4] By restricting games to a formal and abstract structure, SRA has the unwelcome consequence of ignoring many (aesthetic, representational, narrative) aspects which are commonly perceived as crucial to the identity of videogames.

Because of the previous issues, no one seems to have endorsed SRA in this form in the literature. Such "formalism", understood as "the view that the essential nature of a game is its rule-set" (Nguyen, 2017, p. 9), is something of a strawman. This isn't to say, however, that rule-based

[3] See Salen & Zimmerman (2003, p. 120); Juul (2005, pp. 13-15), Koster (2005, p. 168), Bartel, (2018, p. 16), Declos (2020, p. 206)
[4] For similar remarks, see Koster (2004, p. 168) and Bogost (2007, p. 242).

ontologies of (video)games haven't been defended the literature. In fact, there are several amended and more sophisticated versions of SRA out there. I'll now consider a few of these proposals and their respective limits.

Grant Tavinor (2011) agrees that rules are not sufficient to individuate videogame types. Videogame rules or algorithms, he says, must additionally be "interpreted in terms of a set of representational aspects, such as art, character, level, and environment design, because changes in these qualities impact on identity in videogames". For that matter, Tavinor contends that a videogame type should be characterized as "an algorithm as interpreted by a set of artistic assets". On that view, the identity of a videogame type depends on its rules/algorithms *plus* its front-end or representational features:

> (**Tavinor**) *x* and *y* are tokens of the same (video)game type iff *x* and *y* are produced by –comply to– the same rules/algorithms as interpreted by the same set of artistic assets.

This proposal can account for the qualitative variation exemplified by different playings of the same game: however different they may be, these playings are produced by the same rule-set and the same set of artistic assets. It also explains away the *Capman* problem: though they share the same algorithmic structure, *Capman* and *Pacman* are different videogame types, because their artistic assets diverge. Lastly, this model avoids the "overly reductive" objection, since it explicitly takes into account the aesthetic or surface aspects ignored by SRA.

The main issue with Tavinor's view, however, is on the persistence side of things. As stated, the view suggests that a videogame type consists in a given set of rules mapped on a given set of artistic or representational assets. But the identity of a set rigidly depends on that of its members. As such, *any* change of rule or of artistic asset would count as a change of set, and hence, of videogame type. Every component of a videogame ends up being essential to its identity. But just as it seems wrong to say that games cannot survive the slightest change of rules, it also seems mistaken to claim that *any* modification to the shaders, polygonal models, sounds effects, virtual camera or sprites would affect a videogame's identity. To avoid this unwelcome consequence, more fine-grained persistence conditions for both rules and artistic assets would need to be specified. But how this may be done Tavinor does not say.[5]

Dominic Lopes (2001) suggests a different option, which amounts to adding a "genetic" component to SRA. This extra condition stipulates that a (video)game is partly individuated by a causal link to a given author or tradition. More formally:

> (**Lopes**): *x* and *y* are tokens of the same (video)game type iff (1) *x* and *y* are produced by –comply to– the same or similar rules and (2) *x* and *y* can be causally related to the same author/tradition.

The identity of a game type, on that view, isn't just a matter of rule-set, but also depends on its origin or history. Lopes considers this genetic clause necessary for two reasons. The first is that compliance to the same rule-set does not entail sameness of game type: "Students at the Lyceum who might have played a game with rules identical to those of cricket were not playing cricket (…) the playing of a game with the same rules but which is not part of the tradition is the playing of a different game." (Lopes, 2001, p. 76). The second reason a genetic clause is needed is to account for the persistence of games despite changes in rules: "all playings of a game must share a common

[5] Couldn't Tavinor avoid this objection, were he to abandon set-theoretic language? For instance, couldn't he speak more loosely of "collections" of rules and representational assets, and allow that these collections can change to some extent without affecting the identity of the relevant game type? Unfortunately, this wouldn't help much. For then, one would still need to explain what makes it that some changes or rules or representational assets are identity-preserving, and that some aren't. Tavinor's view offers no resources whatsoever as to determine where and how this line could be drawn.

ancestor [because] the rules of a game can change. It is fair to say that this changes the game, but playings of the game under new rules remain playings of the same game" (Lopes, 2001, p. 76).

Lopes' theory explains why people independently creating an identical set of rules (or a same program) would not create the same game type, or why a replica of *Pacman's* code randomly generated by a computer isn't an instance of that videogame. This is simply because the genetic condition would be violated. In addition, Lopes' view seems able to account for the persistence of (video)games through change. Take the collectible card videogame *Hearthstone*, which is regularly updated with patches and additional content. *Hearthstone* survives these changes of rules, Lopes could say, because there is an appropriate causal connection between the pre- and the post-patch versions of the game: it is indeed the same collective entity —the studio Blizzard and *Hearthstone*'s developers—who introduce these changes. This, for Lopes, would explain why the identity of *Hearthstone* is preserved through changes of rules.

This being said, Lopes' view is not free of trouble. For a start, it is just as overly reductive as the unqualified rule-based account initially considered. Here, games are individuated by their rule-sets *and* their history. The genetic condition, though, just tells a causal story. It does not grant any ontological importance to the representational, narrative, and aesthetics aspects of games. Secondly, it is unclear whether Lopes really avoids the *Capman* problem. *Capman* is imagined to be a *Pacman* "clone": someone takes the source code of the original *Pacman* game and tinkers with it until they get *Capman*. But if that is so, there *is* a causal link or lineage of some sort between *Pacman* and *Capman*. Since the two videogames share the same rules by hypothesis, it seems that Lopes would therefore be forced to the unwelcome result that *Pacman*=*Capman*. Third, and more generally, it is unclear how Lopes precisely explains the persistence of games through rule change. As stated, his account preserves the identity of a (video)game type with *any* rule change, provided a relevant causal lineage. Where Tavinor's view was too rigid, Lopes' seems too liberal. For instance, if all chess federations suddenly agreed collectively to make chess a three-players game, we wouldn't readily think that the identity of the game is preserved, even though there would be a relevant lineage in that case.[6]

We may consider a final amended form of SRA. Chris Bartel (2018) suggests that the identity of a (video)game type may lie in its rule-set *plus* the "skill set" associated with the game. A skill set is understood as "a broad set of techniques, strategies, and tactics associated with playing some game" (2018, p. 16). Since Bartel takes these two conditions to be individually necessary, we have:

> (**Bartel**): *x* and *y* are tokens of the same (video)game type only if: (1) *x* and *y* are produced by –comply to– the same rules; and (2) the same set of skills is required to play *x* and *y*.

Although this view might efficiently account for transmedial games, as Bartel argues, it faces several of the objections I have been considering before. First, as Bartel acknowledges, this view cannot dispose of *Capman* cases. In light of such counterexamples, he reckons that "the rule constraint and the skill set constraint are two necessary conditions for the individuation of games, but they may not be jointly sufficient conditions. Perhaps there are further conditions that should be added" (2018, p. 18). But until we have specified these further conditions, the worry remains. In addition, Bartel's view is vulnerable the "overly reductive" objection: rules and skill sets, indeed, are neither individually nor jointly sufficient to account for the importance of surface elements in (video)games. As such, and pending further refinement, his view is unsatisfactory.

[6] To be fair, Lopes writes in a note that "what we should say is that a set of rules are constitutive of the same game only if they belong to a lineage." (2001, p. 81, fn. 16). Since the condition stated here is only necessary, it would block my objection that belonging to a given lineage isn't *sufficient* for sameness of game type. However, if that is indeed all that Lopes contends, it simply becomes unclear how he accounts for rule change at all. The necessary condition merely states that rule-sets which are already considered as instances of the same game type must belong to a lineage. This may well be so, but that doesn't explain how the identity of a game type can be preserved through a change of rules.

While rule-based accounts of the identity of (video)games may initially seem plausible and promising, I argued that they all are unsatisfactory in one way or another. Given the overall inadequacy of rule-based accounts, I would now like to consider a different option, which may be called the "algorithmic ontology".

3. The algorithmic ontology

According to Shelby Moser (2018), a videogame's identity lies in the algorithms encoded in its program. More precisely, she proposes that a videogame type can be identified with what she calls the CGA, or "Complete Game Algorithm". The CGA is the most general algorithmic structure of a videogame, governing all of its formal and representational aspects. The CGA, as Moser defines it, extends beyond the rules of the game in an ordinary sense. It also covers "prescriptions for things such as features of the sprites and characters, expressions, colors, background textures, music, text, animations, mood lighting, narrative, and other art assets." (2018, p. 50). In addition, Moser also accepts a genetic or historical clause, for the same reasons as Lopes. Her proposal is as follows:

> (**AO**): x and y are instances of the same videogame type iff (1) x and y are produced by the same CGA and (2) x and y are causally linked to the same author/tradition.

Moser's theory has a noteworthy feature. According to her, the CGA corresponding to a given videogame type always leaves open the possibility of modifying the game's program in certain ways. The game developers would "allow" a number of possible future modifications and encode this possibility in the algorithmic structure of the game. For this reason, a videogame type is not rigidly identified to a determinate algorithmic structure. Instead, it corresponds to that particular structure *along with potential variations of that structure*. Moser contends that the CGA corresponding to a given videogame type covers not only the game as initially released but also several potential videogames, that correspond to the "authorized" modifications: "The CGA comprises a single videogame work, which can afford many different potential games (appreciated from the displays)" (2018, p. 53). The same CGA may be found in videogames which differ in terms of rule-sets or representational features. Despite their differences, these games nevertheless count as tokens of the same videogame type.

The interest of this view is that it allows one to safeguard the identity of a videogame across *certain* changes in rules or algorithms. Some, but not all modifications (or "mods"), will be identity-preserving. Moser emphasizes this point through an analogy :

> Imagine the CGA is like a sealed black box with inputs and outputs that look like sockets. These ports, which are designated by the creators, are what allow for certain modifications, or the mods; let's analogize a mod to an electrical plug. Just as a plug can only work in an appropriate outlet that can grip its prongs, a mod can only interact with the algorithm through the designated inputs. In other words, the mod will not affect the identity of a game if it is permitted by the CGA. (2018, p. 53-4)

This algorithmic ontology has several merits. It can dispose of the *Capman* problem. If *Capman* and *Pacman* have different CGAs, they are distinct videogame types. If they share the same CGA —that is, if *Capman* is an authorized *mod* of *Pacman*—, they are instances of the same videogame type. The correct option will depend on the actual make-up of *Pacman*'s algorithmic structure (i.e., what exactly its CGA "allows") and on how the creator of *Capman* decides to modify that structure. This is, at least in principle, an empirically decidable question. Second, AO preserves the identity of videogames across *some* rule changes. This is a sensible view, as it ordinarily seems that some of these changes are irrelevant ontologically speaking, while others clearly are not. Lastly, AO is not

overly reductive. As mentioned previously, the CGA does not merely encompass the game's rules or algorithms in a narrow sense. It also takes into account the representational and front-end characteristics of videogames. AO can thus supposedly account for the "aesthetic" features of videogames, as should any adequate ontology of games.

Moser's view, then, is attractive for several reasons. However, it faces at least three major issues.

To begin with, how do we decide which changes are "authorized" by a given CGA? How many different potential videogames does a CGA allow for at its creation? How are we to differentiate mods that preserve the identity of the videogame type from those that don't? AO provide no systematic means to answer these questions. We may speculate that a change of font in the menus of *NHL 22* is authorized by its CGA —such a modification was presumably foreseen and allowed by the game developers. On the other hand, introducing a game mode with flying players and 200 invisible pucks in play all at once would clearly be forbidden by the CGA: this would require a deep alteration of the game's algorithmic structure and would amount to creating a new videogame type. But between these extreme cases in which our intuitions are clear, lie many intermediate cases where it is undetermined whether the proposed modification is "authorized" or not ; and therefore, where it isn't decidable whether the identity of the considered videogame is preserved.[7] If that's correct, AO implies that the identity of videogames is *vague*: often, there will simply be no answer as to whether *x* and *y* are instances of the same work type, or if *x* can survive certain changes. This conclusion seems unsatisfactory.

Second, even if one managed to precisely identify what a CGA allows or proscribes, another concern would remain. Moser assumes that a videogame and its allowed mods will systematically share the same CGA. This, supposedly, is what explains how the identity of the work type can be preserved through a series of mods. However, a problem lurks here. Suppose that a videogame V and its allowed mod V* are the same videogame type because the novel elements found in V* were initially permitted by V's CGA —the developers had anticipated such a possible change and encoded it in V's algorithmic structure. Now, even if V* is an allowed mod of V, V* need not necessarily have the same CGA as V, because the changes introduced by V* could open up new mod possibilities, that were not initially allowed by V. If an authorized mod is akin to a plug in a designated outlet, the issue is that the mod/plug can itself come to play the role of another outlet. If the CGA is a dispositional structure that encodes not only an *actual* rule-structures but also *possible* rule-structures, and if these possible rule-structures further encode different possible rule-structures, then a videogame and its (allowed) mods may not necessarily share the same CGA. This suggests, *contra* Moser, that sameness of CGA is not necessary for tokens to be instances of a single videogame type.

Finally, AO leads to a kind of sorites paradox. Take a MOBA videogame such as *Heroes of the Storm*. If the game developers were to increase the speed of playable characters by 0.01%, this change would hardly be discernible. Moser would certainly grant that such a minor modification is "authorized" by the CGA. The resulting videogame would therefore remain an instance of the same videogame type. However, suppose now that the developing team iterates the operation, gradually increasing the movement speed of heroes by 0.01%. The gameplay would become harder and harder, before finally being completely impracticable. It seems false to say that the game would remain the same, once the speed of playable characters is increased by 5000%. But this is the conclusion that Moser must accept. Identity, of course, is transitive. So if a +0,01% speed increase

[7] One could propose that a modification is allowed only if it is sanctioned by the copyright holder (i.e., the videogame studio) or the developing team. I think that this line of reply works fine in the case of patches, since these changes are effectively brought and sanctioned by the copyright holders. However, it doesn't work in the case of mods, as these are generally player-made and unofficial.

preserves identity, then so does another, and another, up to any point —otherwise, there would be an *ad hoc* demarcation. AO therefore leads to the implausible conclusion that any change in the values of the algorithm's variables preserves identity. In fact, the same reasoning shows that AO will preserve identity beyond reason. If we reframe the argument so as to bear on enough parameters at once, we might in principle go from any videogame X to any other videogame Y, with the (absurd) result that X=Y.[8] If that's so, the algorithmic ontology makes the identity of videogames not only vague (as per the first objection) but also empty: any game is considered the same videogame type as any other.

If the previous objections are valid, AO is unsatisfactory. Despite its ability to meet the objections framed against SRA, this view has several unpalatable consequences: it renders the identity of videogames a vague and arguably trivial.

4. Code Theory

If rules or algorithms do not provide identity conditions for videogames, then what does? There is another option to consider here. Videogames, at their most basic level, are all made of one and the same thing, namely *code*. This is something they share with other kinds of computer programs and digital artifacts. Creating and distributing a videogame requires writing and replicating a certain sequence of source code —a series of instructions written in a high-level programming language (such as C++ or Python). This source code ultimately reduces to long series of 0s and 1s, i.e., to *machine code* executable by a computer. Regardless of these details, it is a factual truth that videogames are built up from code.

Therefore, and as Declos (2020) proposes, why not say that the identity criterion we are seeking is simply sameness of code? According to this view, a videogame type would be a given set of code lines (those present in the original game's encoding) and any replica of this code would be an instance of this videogame type:

> **(CT)**: *x* and *y* are instances of the same videogame type iff *x* and *y* are produced by the same computer code

However, this proposal is subject to obvious objections. The first is that a replica of *Pacman's* code randomly generated by a computer or by the wind at the surface of Mars would, on this view, be an instance of *Pacman*. This seems wrong, at least if we assume that videogames are artifacts which must necessarily be produced by intentional agents. Another worry is that CT implies that *any* modification of a videogame's source code leads to the creation of a new videogame type. This means, implausibly, that even the smallest patch would constitute the creation of a new and distinct videogame type.

These concerns can be addressed simply, though, by adding a historical or genetic condition to the criterion. If games are distinguished not only by their code but also by their origin, randomly generated or Martian replicas of *Pacman*'s code are not instances of *Pacman*, and patches can preserve the identity of a game despite changes in the underlying code. Therefore, a suitably amended version of code theory is:

> **(CT*)** *x* and *y* are instances of the same videogame type iff (1) *x* and *y* are produced by the same computer code and (2) *x* and *y* are causally linked to the same author or tradition.

CT* has several advantages. First, although this view only accounts for a subset of games (namely, *video*games), it naturally extends to all digital artifacts (desktop software, VR and AR environments, websites, digital artworks, etc.). Second, CT* provides the requested verdict in the

[8] Goodman (1968, pp. 186-7) uses a similar argument to motivate his claim that the identity of a noted musical work lies in its exact compliance to the score.

Capman scenario: it correctly concludes that these two artifacts are distinct videogame types, since their codes differ (as they must if the programs use different artistic assets). Third, CT* cannot be criticized for being overly reductive. After all, code encompasses *all* aspects of videogames, including their front-end, narrative, or aesthetic features. Thus, CT* can pay justice to the fact that all the representational and front-end aspects of a videogame matter for its identity. Lastly, it's worth noting that CT* can also explain how very different playings may still be considered as tokens of a single videogame type. All playings of a given videogame, even when they vastly differ, are made possible by (and are effectively interactions with) the same code structure.

However, CT* faces several challenges.

First, this view implies that there are no transmedial videogames, at least in the following sense: no videogame could ever be identical to (i.e., be the same work type as) a *non-video* game. For instance, CT* entails that physical chess and digital chess are not the same game, insofar as the former is not made up of computer code. But if someone were to beat a chess grandmaster such as Magnus Carlsen in an online match, would it really be considered a different achievement than beating him in person? Should we have two separate leagues for chess —one for virtual chess and one for physical chess? Since this sounds absurd, the objection goes, we should better reject CT*.

Secondly, it is incorrect to assert that each given videogame corresponds to a single ordered sequence of code lines. Many videogames can be played on different gaming platforms. Moving a game from one hardware system to the other —a process known as "porting"— is a common practice in the gaming industry. However, porting a game often requires modifying its code architecture, in order to adapt it to the demands and idiosyncrasies of the target hardware system. For instance, the source code corresponding to the PC and tablet versions of *Hearthstone* are not the same, because the specific hardware constraints are different in each case. Thus, CT*, implies that each ported game constitutes a distinct videogame type. This is strongly counterintuitive, insofar as these sequences of code, however different, enforce the same rules, and can generate visually indiscernible displays (see Moser 2018, p. 47). Furthermore, it's important to note that cross-platform play or "crossplay" (McDonnell & Wildman 2019) is very common. I can play *Hearthstone* on my tablet while my opponent plays on their phone. The code involved in each device is different. But since we are playing one against another in real time, aren't we clearly playing the same videogame? Would our activity even make sense if this were denied? Considering the prevalence of porting and crossplay, CT* contradicts many of our ordinary beliefs and practices to such an extent that the account seems clearly inadequate.

A last issue is that CT* implies that any part of a videogame's code is *essential* to its identity at that time. This leads to counterintuitive verdicts. A replica of the code found in the current version of *Hearthstone* but with an extra comma, for instance, would not be the same game type – even if this involved no change in behavior of the program. Similarly, CT* considers that things typically considered ontologically inconsequential —such as developers' comments, bugs, or dead code— are just as important as anything else in a game's identity, because they are part of the code. Moreover, while CT* can preserve the identity of a game type through authorized changes to the code (as with patches), it doesn't seem capable of doing so for unsanctioned changes. Therefore, if a third party mods a game, fixes a bug, or even adds or removes a single character in the code, it would create a distinct work type rather than modifying an existing one. This, again, is a counterintuitive result.

These objections to code theory certainly contribute to its unpopularity in the literature. However, it should be noted that these issues might be mitigated to some extent.

Firstly, the crossplay issue seems innocuous when considering that cross-platform play often utilizes game servers, which run their own code.[9] For instance, while the code involved in the PC and smartphone versions of *Hearthstone* is different in each case, the *Hearthstone* servers that enable crossplay run one and the same code – and *this* verdict is compatible with CT*. In other words, the crossplay problem is resolved if we can consistently differentiate between code on the user (or client) side and code on server side, with the latter remaining unchanged.

Secondly, proponents of CT* might want to bite the bullet of the porting problem, by maintaining that hardware variation isn't deprived of ontological consequences. As Chris Bartel notes, "it is arguable that (for example) *Donkey Kong* as played on an original arcade cabinet is a different game from playing *Donkey Kong* on an NES" (2018, p. 21, fn 7; see also Tavinor 2011). After all, games promoted under the same title on different gaming platforms differ sensibly in terms of graphics, controls, gameplay, or in other dimensions. It doesn't seem unwarranted, then, to consider these as related yet strictly separate games. This observation aligns with common practice: videogame websites often assign different ratings and publish distinct reviews for a game running on different platforms (say *The Witcher 3* on PC *vs*. *The Witcher 3* on PS4).

Finally, the essentialist implications of CT* may not be as radical as they initially appear. For instance, it could be argued that bugs positively contribute to the identity of the videogames in which they are found, insofar as they generate some significant, albeit unintended, fictional content (see Van de Mosselear & Wildman, 2021). Consider the infamous "MissingNo" glitch in the original *Pokémon* videogames. That bug made history —it even earned its own Pokémon card. Arguably, a version of the game where this bug was fixed would not have been just the *same* game. As another example, speedrunners often exploit bugs to optimize their runs. Remove the infamous wall clip or flagpole exploits from *Super Mario Bros*, and you get a significantly different videogame, from the purposes of speedrunning. Similar strategies might be employed to explain why other aspects the source code that are typically considered irrelevant to the game's identity —such as dead code or developer's comments— hold ontological significance.

Even with all this said, one must acknowledge that CT* does not entirely align with our common beliefs about videogames. This theory posits distinctions between game types where we might not intuitively see them (as with ported versions, mods, or transmedial games). Moreover, it implies that many elements we typically consider inconsequential (such as bugs or developers' comments) matter just as much as the rest in the identity of videogames. Because of these revisionary implications, some may argue that code theory is not really satisfactory. But this view, at any rate, doesn't fare worse than rival accounts, which also challenge our common intuitions about games in certain respects.

5. Contextualism

The last theory I wish to discuss is Michael Ridge's contextualist ontology of games (Ridge 2020). Ridge acknowledges the incompatibility of a rule-based ontology of games with two widespread intuitions. The first is that games are able to survive at least some change of rules. The second is that a game may exist in multiple variants concurrently, each differing in terms of rule-set. As a result, those willing to individuate games by their rules while upholding these intuitions face the challenge of explaining the persistence of games across diachronic change or synchronic variation.

To solve this twofold puzzle, Ridge distinguishes several senses of the word "game". In a somewhat Platonic sense, and just as SRA states, a game is "an individual token contest which is constituted by certain goals and rules" (2020, p. 8831). Call this a "game$_{tc}$". (Ridge also uses the label "game$_{AE}$" to denote more specifically the abstract entity associated with a given token

[9] Thanks to an anonymous reviewer for helpful comments here.

contest). But there is another widespread and relevant sense, Ridge argues, according to which games are "historically embedded social practices", like languages or laws. Call this a "$game_{sp}$".
Now, the solution: although no $game_{tc/AE}$ can survive any kind of rule change, this isn't so for a $game_{sp}$. A social practice may evolve over time without losing its identity. The same goes for a $game_{sp}$. Likewise, just as a social practice may contain different variants (or sub-practices) at a given time, so do $games_{sp}$. The twofold puzzle is thus solved by disambiguation: once we realize that two distinct concepts of "game" are at play here, the apparent conflict disappears. We may at once say that $games_{tc/AE}$ are individuated by their rules (so that they can't change) *and* maintain that $games_{sp}$ persist through some rule modifications (so that they can change).

Ridge also outlines how $games_{sp}$ evolve and may survive at least some alterations. At the start are people engaging in a $game_{tc}$: an activity which corresponds to a specific rule-set (viz., a $game_{AE}$). Newcomers take part in more of these token contests by learning these rules, before teaching them to other individuals. At some point, this activity solidifies into a codified social practice or $game_{sp}$, with its own history and spirit. Various changes may be proposed and debated by the participants. It is up to them to decide which of these proposed modifications will be accepted and which variants shall count as "the same $game_{sp}$". At these crossroads, says Ridge, "participants within the practice will characteristically appeal to what they take to be valuable about the game as it stands. Tradition, precedent and the 'spirit' of the game will also serve as reasons, and so on" (2020, p. 8834). For this reason, the criteria used to adjudicate whether two $games_{sp}$ are the same will be specified contextually and on a case by case basis. In general, there will be sameness of $game_{sp}$ when "those taking part in a later stage of the social practice take themselves to be bound, ceteris paribus, to respect precedents and values (implicit or otherwise) associated with an earlier stage of that practice" (2020, p. 8840).

In a nutshell, Ridge's account is therefore the following:

> (**Contextualism**) Token contests *x* and *y* are instances of the same $game_{sp}$ iff *x* and *y* are part of the same game-constituting social practice.

This contextualist approach has many merits. One is its ability to account for all types of games, including videogames. Another is that it reflects the importance of historical factors for the identity of $games_{sp}$. Ridge even goes a step further here, by giving ontological weight to the experience, perception, and values of the individuals engaged in a gaming practice. Moreover, Ridge's account is able to explain why individuals interacting with the same rule-set (i.e. the same $game_{AE}$) can nevertheless take themselves to be engaged in quite different gaming practices, so that they can be described as playing different $games_{sp}$. In the case of videogames, this might effectively explain why one and the same videogame can be associated with very different gaming practices (e.g. that of casual gamers, e-sport athletes, streamers, speedrunners, etc.).

In addition, we should note that Ridge's account deals squarely with the initial objections framed against rule-based accounts. First, the *Capman* puzzle is solved: *Pacman* and *Capman* are the same $game_{AE}$ (for their rule-set is identical), but they may or may not be counted as the same $videogame_{sp}$, depending on the users' perception, values and practices. Second, the "overly reductive" complaint seems to have no currency here, for various characteristics, including its front-end or aesthetic features, can be taken into account by participants when determining what constitutes the identity of a $game_{sp}$. Lastly, unlike SRA, this contextualist account does not deliver intuitively wrong persistence conditions. As we saw, it is structurally built in order to explain the persistence of $games_{sp}$ through diachronic changes or synchronic variation in a way that matches our actual beliefs and practices.

However, and despite these merits, there are some issues with this contextualist ontology. I'll mention five.

First, imagine that Sarah has just finished designing a game prototype that no one has actually playtested yet. The prototype qualifies as a $game_{AE}$ but not as a $game_{sp}$, since it did not give rise to any form of social practice. Now, say that Sarah decides to alter a minor rule point in the prototype. This is a change of $game_{AE}$. However, given the minimal character of that modification, we might want to say that resulting game is a mere *variant* of the other. This conclusion is prohibited by Ridge's account, however: according to him, $games_{AE}$ cannot survive any kind of change or variation whatsoever. Only $games_{sp}$ can. Sarah, in this example, would therefore come up with a wholly different game, just in the same sense as if they had completely reworked the prototype. This seems wrong. So, if we think that it makes sense of speak of variants for $games_{AE}$, or to say that a $game_{AE}$ may survive some rule changes, Ridge's account is inadequate.

A second issue is that Ridge's account does not match our intuitions about how games are in existence. Consider popular videogame franchises such as *Call of Duty, Assassin's Creed*, *NHL*, and the like. Games within these franchises generally have very similar rule-sets. They also typically conform to the same guidelines and values, and generally can be described as corresponding to the same gaming practices. Despite criticisms that the studios behind these franchises are just "re-selling the same game every year", there's no doubt that each opus in a given series is a numerically distinct work type from the games that come before and after it. What the complaint is really getting at is that these franchises are repetitive in content and hardly ever innovate ; not that manufacturers literally keep selling the same videogame over and over.

Ridge cannot make sense of that, however: if the people playing *NHL 22* take themselves to be bound to respect the very same precedents, values, and spirit as people playing *NHL 21*, then they are playing the same $game_{sp}$. As such, Ridge's view has the unwelcome consequence of yielding less $games_{sp}$ that we think are in existence. Now, it is true that Ridge could point out that videogames in a franchise still differ in *some* sense, namely as $games_{AE}$. But that reply isn't satisfying. Someone saying that *NHL 21* and *NHL 22* are different videogames does not simply suggest that they differ merely at the abstract level of rules. What they mean is that these are really different *works*, which may have quite a different content, gameplay, appearance, production history, etc. Ridge's account, then, will have some revisionary consequences on this score.

Third, we may challenge one direction of Ridge's biconditional, and deny that if two token contests are part of the same game-constituting practice, then they are instances of the same $game_{sp}$. Indeed, it does seem possible that people would conform to the same values and precedents while playing what we would consider to be, intuitively, very different $games_{sp}$. Suppose that 50 years from now, *Hearthstone* has evolved into *HearthPwn*: an online digital collectible card videogame mixed with FPS elements, where one would play cards on one side of the screen before shooting enemies controlled by your opponents on the other side. Provided enough intermediate steps between *Hearthstone* and *HearthPwn*, it does not seem inconceivable that *HearthPwn* players could perceive a continuity in value, tradition, or spirit between the videogame they are playing and *Hearthstone*. According to Ridge's criterion, these would therefore be the same $videogame_{sp}$.

This, however, does not sound right. Whatever the participants may think, we would intuitively judge that the two $videogames_{sp}$ differ quite drastically. The reason for that is that the associated $game_{AE}$ is too radically different in each case. An online card videogame, we want to say, cannot become a FPS-hybrid without losing its identity as a $videogame_{sp}$ in the process. This conclusion isn't specifically motivated by values, tradition, or user perception. It is grounded in the nature of the rules and mechanics themselves. Put otherwise, some changes of $game_{AE}$ just are too major to preserve the identity of the corresponding $game_{sp}$, no matter what participants within the social practice may think. If that claim is correct, a perceived harmony in values or tradition is not sufficient to guarantee sameness of $game_{sp}$.

Now, we can expect Ridge to reject the *HearthPwn* scenario on the grounds that such an extreme change of game mechanics would necessarily imply a change of values, tradition, or spirit.

Likewise, chess could not become a three-player game without some groundbreaking alteration with respect to chess history and precedents. But even if such extreme cases were dismissed in this manner, the fundamental concern persists: one can conceive scenarios where what we would consider as very different games$_{sp}$ would nevertheless be counted as "the same game$_{sp}$" in virtue of the participants' perception. The overall issue, then, is that Ridge's account is too liberal: it allows that a game$_{sp}$ could evolve into almost anything else, as long as participants think that they still are engaging in the game-constituting practice.

A fourth problem with this contextualist ontology is that it leads to a problematic form of vagueness. Recall that Ridge's criterion for sameness of game$_{sp}$ is that "those taking part in a later stage of the social practice take themselves to be bound, ceteris paribus, to respect precedents and values (implicit or otherwise) associated with an earlier stage of that practice" (2020, p. 8840). We cannot expect such a condition to be satisfied by *all* participants in the practice, nor merely by *a few* of them. For, in the former case, a single dissenting participant would be enough to disrupt the identity of game$_{sp}$; while in the latter, a majority of dissenting participants wouldn't be sufficient to speak of a change of game$_{sp.}$ For this reason, Ridge considers that we can only expect this condition to be satisfied by *most* participants. As he reckons, this will result in "considerable indeterminacy in when two stages of a social practice should count as the same game$_{sp}$" (2020, p. 8841). Ridge denies that this is much of a concern, though, for:

> after all, it *does* seem quite indeterminate in many cases whether we have the same game or a different one in this sense. In fact, it is a virtue of a theory if it posits indeterminacy in a concept which roughly matches the indeterminacy in folk applications of that concept. (2020, p. 8841)

However, I think that such indeterminacy should not so lightly be embraced. First, it has unpalatable consequences. Gamers are very frequently divided as to whether a recent patch (or mod or port or DLC or remaster) defaced their favorite videogame, to the point of making it a different game$_{sp}$.[10] Saying that there is no correct answer in such cases may echo the conflicted intuitions at play, but this also means that we won't be able to say whether the corresponding game$_{sp}$ has survived that change. Again, such a conclusion has many real-world implications: it means that videogame journalists will have no grounds to decide whether they should write a new review for a recently patched videogame; that at least some copyright disputes will be intractable; that game designers won't have clear guidelines as to what can and can't be done when they are working on the next patch, and so on. Biting the bullet of indeterminacy does not make its consequences any less problematic.

In addition, this indeterminacy claim makes disagreement among players unintelligible. Imagine a controversial *Hearthstone* patch, where players would be irremediably divided as to whether the identity of the game$_{sp}$ is preserved by the newly brought change. Ridge's model suggests that there is no single right answer in this case. But this isn't because no given answer is correct. Rather, it is *because both are*. What we should say, on Ridge's view, is that there are here two distinct games$_{sp}$: a game G in which the patch and previous versions of *Hearthstone* are counted as the same game$_{sp}$; and a game G* in which only the previous versions, excluding the patch, are counted as the same game$_{sp}$. But then, the dispute among players seems to become entirely verbal. Each side is trivially right, given what they think is the referent of the name "Hearthstone". Those thinking that it refers to G will conclude that the game$_{sp}$ survived the patch, while those thinking that it refers to G* will deny it. As such, disputants are simply talking past each other, for they do

[10] It might be that gamers who complain that X "is not the same game anymore" do not intend to make any claim about numerical identity or difference, just like one can say "after this event, she was not the same person any longer" without meaning that a person was literally replaced by another. I agree that we should be cautious when trying to read ontological claims from folk discourse. Nevertheless, it is clear that gamers sometimes mean that some changes did (would) literally destroy the game; while others did (would) not.

not talk about the same thing. Each side would agree that the other is correct, given how they use the name "Hearthstone". This does not seem to do justice to the disagreement under consideration. Intuitively, the dispute bears on one and the same thing —the game$_{sp}$ *Hearthstone*— and on whether it could survive such or such change. But given what Ridge says, the disagreement becomes merely linguistic: some recommend using the name "Hearthstone" to denote a certain game$_{sp}$, while others wish to use it differently. As such, it seems that Ridge's proposed criterion for sameness of game$_{sp}$ will make many apparently legitimate disagreements become entirely verbal.

A last issue remains to discuss. Ridge acknowledges that his view leads to a paradox, which is the following (2020, p. 8842). Consider a community playing a certain game$_{sp}$ at time t_5. Say that this community respects the values and precedents of the eponymous game$_{sp}$ played by their ancestors at t_4. These people, in turn, respected the values and precedents of those playing the game$_{sp}$ at t_3, and so on until the original game$_{sp}$ at t_1. Since each community takes itself to respect the values and precedents of the previous generation, the game$_{sp}$ is the same at any t and t_{-1}. By transitivity, we can infer that people at t_1-t_5 all play the same game$_{sp}$. However, this scenario is perfectly consistent with the fact that people at t_5 do not take themselves to be engaged in the same kind of gaming practice as people at t_1. If so, we cannot say after all that they play the same game$_{sp}$. Contradiction.

Ridge's solution is the following. In this scenario, each community is playing the same game$_{sp}$ as its direct predecessor. But this is consistent with the possibility that some of these communities engage in *more than one* game$_{sp}$ at a time. People at t_5 and t_4 may play a given game$_{sp}$ G, but this does not prohibit that those at t_4 are *also* playing a distinct game$_{sp}$ G* , which is played by those at t_3 but not by those at t_5. This move, when generalized, gives us the desired result that each community plays the same game$_{sp}$ as the previous one, without entailing that there is a single game$_{sp}$ which is played by all of them. This solution, however, only works if one accepts that "one generation is, in virtue of precisely the same game playing activity, simultaneously playing two distinct games" (2020, pp. 8842-3). Despite Rigde's attempt to illustrate how this claim might make sense (2020, pp. 8843-5), it remains objectionable, for several reasons.

Firstly, suggesting that the very same token actions —people moving pawns, running and jumping, pressing controllers, etc.— could simultaneously constitute numerically different games$_{sp}$ contradicts common intuition. The worry, here, is not so much the idea that distinct social practices are within one and the same token action. A given artistic performance, e.g., can unproblematically be at once a political protest and a tribute to another artist. My concern is rather with the suggestion that we could play multiple game$_{sp}$ unbeknownst to us. Participants within a gaming practice are certainly not aware of any such thing, and most would readily assert that they are just playing one and strictly one game$_{sp}$.

In addition, Ridge's move commits him to a potential overpopulation of games$_{sp}$. If we grant that the same token actions can constitute two different games$_{sp}$, why stop at two? If you suitably complexify the scenario, you may in principle get the result that one and the same sequence of token actions constitutes a plethora of different games$_{sp}$. Put otherwise, there could be many spatiotemporally coinciding but distinct games$_{sp}$ instantiated in any particular token activity. This proliferation of coincident games$_{sp}$ is metaphysically odd.

Rigde's reply to the foregoing paradox, lastly, gives rise to a skeptical concern. When people engage in token contests, they may believe that (or wonder whether) they are playing the same game$_{sp}$ as people before them. However, they certainly do not wonder if they are playing the same game$_{sp}$ as *future* participants, for they do not know how or even if these future individuals will alter the game. But given what Ridge says, any current gaming activity might be the same game$_{sp}$ as an indeterminate amount of future games$_{sp}$, provided that these are relevantly correlated to our current practice. Therefore, in order to make sense of Ridge's solution, we need to accept the bizarre view that we never know how many games$_{sp}$ we are playing when we are participating in a given token contest, and that this fact can only be settled retrospectively (strictly speaking, it will only be settled

at the end of time, once no more social practices lie ahead of us). Ontologically speaking, this also has the odd consequence that that nature and identity of the activity we are currently engaged in depends on entities and practices which do not yet exist. So: Ridge's solution to the foregoing paradox implausibly entails that we do not know exactly which $game_{sp}$ nor how many $games_{sp}$ we are playing, when are engaging in a gaming activity.

The previous objections demonstrate that Ridge's contextualist ontology is not entirely satisfactory. Despite its merits and initial appeal, this account does not align with our pre-theoretic intuitions about games and leads to a number of unpalatable consequences.

6. Conclusion

This paper surveyed various theories in the ontology of videogames, each attempting to provide identity conditions for these digital artifacts. Despite their respective merits, I argued that none of these theories is entirely satisfactory. This negative result does not mean that identity criteria cannot be found. More sophisticated versions of each theory might be devised, potentially avoiding the issues faced by their current counterparts. It is also possible that no consistent systematization of common sense beliefs about games exists, so that we may go revisionary in good conscience. Alternatively, some will insist that videogame ontologists should focus more on user experience. They might also need to consider actual legal and industrial practices to better substantiate the notion of game identity. Finally, perhaps we simply need fresh horizons. The literature in social ontology, in the metaphysics of artifacts, or in the philosophy of sport, too often ignored by game scholars (a flaw evident in this paper too), might provide interesting resources or suggest new leads to account for the identity of games. There is still much to explore, and the work can proceed in various directions. But in the meantime, an adequate ontology of videogames is still missing.[11]

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