Contemporary Aesthetics

Volume 9 (2011)

2011

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Abstract
Videogames are one of the most significant developments in the mass arts of recent times. In commercial terms, they are now among the most prominent of the mass arts worldwide. This commercial and cultural success does not exhaust the interest in videogames as a mass art phenomenon because games such as *Grand Theft Auto IV* and *Fallout 3* are structurally radically different from previous forms of mass art. In particular, the ontology of videogames, the nature and identity of their works, and how they are instanced and evaluated is a departure from the familiar mass arts of film and popular music. This paper explores these differences in an attempt to fit videogames into a theory of mass art, but also to provide guidance on the issues of criticism and evaluation that surely follow from their ontological distinctiveness.

Key Words
art and technology, interactivity, mass art, ontology, videogames.

1. Videogames and Ontology

Videogames are one of the most significant developments in the mass arts in the last fifty years, and they have become one of the most recent concerns of philosophical aesthetics.[1] While the videogame *Grand Theft Auto IV* is notorious for its graphic depictions of violence and crime, it also provides a richly immersive experience where the player enters the fictional world of Liberty City as a character within that world. Mayhem, and art, ensues. There is reason to expect that our dealings with games such as *Grand Theft Auto IV* have ontological implications of the kind found in the arts generally, that is, issues concerning the ontological status of the artistic works and their varied instances, the nature of artistic performances, and the role of creators and consumers *vis-à-vis* works of art and their performances.[2] Indeed, I contend that understanding the ontology of videogames shows what is genuinely distinctive about this new art form.

Generating most of the interest in the ontology of videogames should be the observation that what is ultimately depicted in videogames is largely shaped by the activities of the player. The world of *Grand Theft Auto IV* is not fixed at the time of its production, as seems the case with traditional mass art fictions; rather, the game exists as a set of possibilities awaiting the input of the player. This interactivity has a profound impact, not only on the artistic structures of videogames, but also on the appreciative practices that attend them. The participatory role the player takes in videogames, that is, in making decisions and performing actions that affect what is depicted by the work, sets videogames apart from other forms of mass art. What, then, is the work appreciated in *Grand Theft Auto IV* that is so dependent on the decisions and actions of the player for its display? Indeed, why should we think that videogames constitute single works, when individual playings can generate such widely divergent instances? Settling these ontological questions is a

prerequisite for understanding the appreciative practices of videogames and formulating an art-critical framework for them.

2. Videogames and Mass Art

What is the ontology of a work of art? In aesthetics, a theory of ontology is meant to explain how individual art works or art kinds exist. As well as clarifying what appreciators engage with when they encounter an art work, the ontology of art works has a bearing on issues such as what it is for art works to be created or destroyed and on work identity. One of the most significant ontological distinctions in the arts is that between multiple instance and single instance art works.[3] Some art works are embodied in single objects: the Washington monument, for example, finds its singular location in the National Mall in Washington D.C. Other works can have multiple instances. The National's album, *The Boxer,* can be can be instantiated at multiple discrete locations and times by playing the disc or digital file on an audio player.

It is relatively clear that videogames count as multiple instance works, and so, on some level, are appropriately grouped with such works as films, plays, music albums, prints, and novels. It seems reasonable to conclude that the ontological schema appropriate for videogames will be of a kind that captures the multiple instance ontology in these other works. Videogames are also obvious candidates for being what Noël Carroll referred to as "mass art," a form of art that Carroll argued is in part defined by its multiple instance ontology.[4] Carroll claimed that an art work is mass art if and only if

> 1. x is a multiple instance or type art work, 2. produced and distributed by a mass technology, 3. which art work is intentionally designed to gravitate in its structural choices (for example, its narrative forms, symbolism, intended affect, and even its content) toward those choices that promise accessibility with minimum effort, virtually on first contact, for the largest number of untutored (or relatively untutored) audiences.[5]

On the face of it, conditions (1) and (2) seem unproblematic in regard to videogames. First, *Grand Theft Auto IV* has multiple displays because the game can clearly be played by many different people in what Carroll referred to as different "reception sites."[6] Second, game consoles and personal computers are quite obviously mass technologies.

Condition (3) might seem to be more problematic given that many popular videogames such as *Grand Theft Auto IV* can be very demanding of a player's skills and game knowledge, and so rely on a base of relatively experienced players for their popularity. A lack of gaming skills, which are themselves quite diverse and are built up slowly over a significant period of gaming, can be a real barrier to new players experiencing these games (as non-gamers will quickly discover if they try playing *Grand Theft Auto IV*). Many so-called "hardcore" videogames are at least as inaccessible to the uninitiated as are avant-garde works of art.[7]

There are two responses available here. Carroll also allowed

that mass art works do involve some previous awareness of the genre or form of art that one is dealing with, so audiences of mass art are not entirely untutored. Much of the tutoring comes through formulaic repetition, an observation that is equally apt for videogames.[8] The appropriate comparison class for the category of mass art is avant-garde art, and when this comparison is made it is quite clear that videogames tend to sit alongside uncontested mass art works because of their characteristic artistic structures and concerns. *Call of Duty: Modern Warfare 2* is of a kind with military thrillers and action movies, and *Grand Theft Auto IV* is very derivative of crime films and television shows, such as *Heat* and *The Sopranos*. Second, what makes demands on videogame players is not necessarily game-specific knowledge or taxing interpretative tasks, although games do demand these to some extent, but the game's physical challenge. Carroll's theory is not framed to account for videogames. Therefore we should not judge his theory on the basis that it does not account for the particularities that arise from videogames' distinctive combination of gameplay and art;[9] nor should we assume that because he does not address this issue of player skill, videogames are not, in his terms, mass art.

Hence, and I think quite intuitively, videogames such as *Grand Theft Auto IV* and the post-apocalyptic open-world role-playing game *Fallout 3* fit Carroll's conception of a mass art work. When we look more closely at the details of how videogames work, however, it becomes clear that there are some significant differences from mass art forms such as movies, television shows, and music albums.

One of the most persistent and useful ways of framing the multiple instance ontology seen in mass art works is in terms of the logical type/token relationship.[10] The type/token relationship prevails where a type can be instantiated by a number of particular objects, such as the movie *Star Wars*, which can be tokened by any number of showings, while not being identical with any one of its instances. Considered as a type, *Star Wars* is an abstract object and is instanced by a number of concrete particulars through which we come to know the type. Though the type is known through its instances, the instances themselves are determined by the nature of the type.[11] What is it about the type that does the determining, that is, what is shared between instances by which they are a type? In the case of *Star Wars,* it is the representational structure that constitutes the work; that is, the collection of audio-visual presentations that depict a plotted sequence of events, such as that Luke Skywalker leaves his home world of Tatooine, joins the Rebellion, and destroys the Death Star.

All properly formed instances of *Star Wars* share this artistic structure, even though, by itself, the shared structure might not be sufficient since a genetic component may also be necessary for identity. Upon travelling to a galaxy far, far away where they encounter an ancient alien civilization and discover an audio-visual artifact looking and sounding identical to what they know as the movie *Star Wars*, our space-faring descendents might wonder whether this actually *is* the movie or merely bears a strong (and exceedingly unlikely)

resemblance to the work, perhaps being, instead, a dramatic reenactment of actual historical events in which a historical figure, Luke Skywalker, helped to defeat the Empire by destroying the Death Star. Settling the issue, presumably, would be the discovery of some relevant kind of causal or intentional link, or lack thereof, to the historical creative act that first tokened the movie.[12]

3. The Artistic Structure of Videogames

Taking guidance from this, we might think that a shared artistic structure between an art work and its instances, and a genetic relationship between those instances and an original creative act, are key to the multiple instance relationship in mass art. But how apt is this logical schema for videogames?

Videogames share much in common with the artistic structure found in *Star Wars* in that their displays are comprised of audio-visual presentations.[13] Moreover, they are both *works of fiction*.[14] All instances of *Grand Theft Auto IV* comprise a fiction, set in Liberty City and detailing the actions of a recent Serbian immigrant to the city, Niko Bellic, and his experiences as he aids his cousin, Roman. But *Grand Theft Auto IV* as an artistic structure is quite different from *Star Wars*. For example, whereas in *Star Wars* the viewer is safe to expect certain events from a properly formed screening of the film (that Luke will leave Tatooine, and that the Death Star will be destroyed), the player of *Grand Theft Auto IV* cannot have such expectations of the plot of the game. In some playings of the game, after Niko decides to deal with his nemesis Dimitri in a drug deal that ultimately goes wrong, Roman Bellic will be killed by an assassin's bullet meant for Niko. In other playings these events do not occur; instead Niko's love interest, Kate, is killed in a drive-by shooting, events that are caused by Niko's earlier decision to take revenge on Dimitri rather than deal with him. This difference results because the narrative of *Grand Theft Auto IV* has several branching points where, depending on what the player chooses, different sequences of plot events are set into motion.

The narrative of the game is also ordered by the mission structure typical of *Grand Theft Auto* games, where narrative cut scenes are cued to missions, explaining the task to come, but also situating the action in the plot of the game. Because *Grand Theft Auto IV* is a sandbox game the sequence in which the missions are taken is optional. Some missions do not even have to be played through to advance in the game. Thus, in instances of the game, the sequence of narrative events also shows considerable variation. Moreover, when we look at the bulk of the fictional events, what is depicted from moment to moment in the gameworld, particularly those events that make up the gameplay of *Grand Theft Auto IV,*[15] no two instances of the game will ever portray exactly the same fiction. There are some variations in showings of *Star Wars* (in some, in their meeting in Mos Eisley Cantina, Han Solo shoots Greedo unprovoked; while in others he appears to be retaliating, Greedo having shot first and missed), but these are attributable to the film having different versions, George Lucas having returned to the work in 1997 to make certain (notorious) changes. The variations between instances of *Grand Theft Auto IV*, which are a great deal more numerous

and significant than this, are not due to different versions of the same work but arise through different playings of a single version.[16]

All of this means that while sharing broad similarities, different instances of *Grand Theft Auto IV* will vary in terms of the sequence and detail of the fiction they present. Role-playing games, such as *Fallout 3* and *The Elder Scrolls: Oblivion,* go even further than *Grand Theft Auto IV* in how variable their individual playings or instances can be by allowing players considerable say over the qualities of the player character and their contribution to the gameplay and narrative events in the game.

Here we are struck with an ontological difficulty. The notion of artistic structures was introduced to explain, in part, alongside genetic considerations, what constitutes the type/token relationship in multiple instance art works. 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. With *Fallout 3*, any two playings are extraordinarily likely to differ in terms of the name, gender, ethnicity, and appearance of the protagonist; the length of the game; the events, direction and conclusion of the narrative; and the bulk of the very basic fictive events that make up *Fallout 3* as a work of fiction. There will be representational elements common to all playings, but the individual playings rendered through these elements are likely to show a wide variance.

To return to Carroll's definition of the mass arts, this variation in instances might seem a complication for fitting videogames under his definition. In explaining condition (2) of his definition, Carroll claimed that "that mass art work is a type whose numerically distinct tokens are identical in the sense that two dimes of the same minting are identical."[17] Thus, while videogames might clearly seem to be mass art, they do not quite fit Carroll's characterization of works with multiple identical instances, since the instances of a videogame work are not qualitatively identical in terms of their audio-visual displays in the way that instances of a film are. Alternatively, if we are quite certain that videogames are mass art works, this feature of videogames might prove difficult for the definition itself, showing that it is not adequate to cover all cases of mass art. Thus, either videogames are not mass art works or, if they are, Carroll's definition of mass art is not capable of explaining why they are.

Indeed, given the lack of a common fiction, playings of *Fallout 3* can be understood to not instantiate new tokens of a single work but new works in their own right. Different playings might be seen as different works sharing artistic elements such as characters and settings, in much the same way that an author might set multiple works in a single fictional setting, or that works of fan fiction might exploit an established artistic setting. In fan fiction, hobbyist authors take the worlds and characters of established fictive canons, such as *Harry Potter* or *Buffy the Vampire Slayer,* to take two popular examples,

and write original works involving the established fictive content. *Fallout 3* might be seen as a *work generator* that allows the player to determine a number of open variables or representational place-holders in order to create new works of fiction. In this case the player might count as an author of a unique work in the same way that a fan fiction writer counts as one.

I think that this is a radical claim and, if at all possible, we should avoid concluding that playing *Grand Theft Auto IV* and *Fallout 3* produces a number of unique works. First, there are relatively clear intuitions on the part of creators, players and critics that instances of the game count as displays of a single work. This is most evident from the growing critical literature on videogames, much of which is predicated on the assumption that the videogame that is the subject of a piece of criticism is the very same work that players will experience when they play the game.

The realization that *Grand Theft Auto IV* is a single work with many displays seems crucial to its appreciation because part of what one appreciates about the game is the range of instances it generates. Certainly one can play through many games in a shallow manner intending merely to get to the end and unconcerned with the scope of possible variation, but increasingly games encourage multiple interpretive playings. Philip A. Lobo illustrates this quite nicely when he argues that *Grand Theft Auto IV* is able to make interesting observations about freedom and responsibility because it has a branching narrative in which the ramifications of the player's choices are manifested through differing outcomes in the gameworld, as discussed earlier here in the case of the alternating deaths of the characters Roman and Kate.[18] Furthermore, unless the player realizes that this aspect of the narrative is a contingent structure, perhaps by replaying it to see how the narrative progresses had he chosen differently in his dealings with Dimitri, then he will not grasp the statement made in the narrative. But even if nothing of great narrative significance hangs on a player's decision, the player must realize that things could have gone differently in order to make sense of his character's agency in the gameworld. That a single work can produce multiple fictions is crucial to the player freedom that is central in open-world videogames.

Finally, as I will discuss later, there are cases of artifacts that come very close to being genuine work generators, and that consideration of these cases shows what gives rise to new works rather than variable instances of a single work.

4. Videogames and Variation

While it is likely that videogames are mass art works, one of their ontological precedents comes from outside the mass arts. I suggest that, in certain respects, videogames are more like jazz performances than film or popular music. In some multiple instance art works, the artistic structure that is shared between the instances of a work may be less richly defined than is the case with mass art forms such as film.[19] Jazz performances are not mass art works, of course, because their production does not employ mass technologies, even though their recordings might. However, individual performances of a jazz standard may share only a melody and a chord

progression and yet all count as performances of the work. In the case of jazz standards, it is the creativity that the performers are able to bring to performances, and the performance tradition that warrants such variations, that allows for the variation between instances.

While videogames might be similar to jazz standards in terms of the variation between their instances, they differ in that the variability of instances is made subject to production and distribution by a mass technology, that is, the computer. In videogames the variation between instances is generated not by a performance interaction with a notated or remembered precedent sound structure, but through the interaction of a player with a technological artifact that encodes the artistic elements of the work. Moreover, in videogames the technological artifact encodes the scope of variation between instances of a single game, setting boundaries on the possible playings of that game.

It might be argued that these facts are also true of some paradigm non-interactive works, and so do not count as real differences between videogames and other, non-interactive works. Granted, in some non-interactive art works the technological artifact used to perform a work places constraints on the works that can be produced with the artifact, so that, for example, the works produced by a piano are limited to having a certain range of notes, being within a particular range of volumes, and having the timbral qualities specific to that instrument. But the technological artifacts underlying videogames stand in a different relationship to their works. Though a piano makes possible a limited range of artistic properties in its works, these artistic possibilities are general to all of the works that the piano can be used to produce. In the case of videogames, the artistic possibilities are specific to a single work because the relevant technological artifact is designed to produce that work alone. Furthermore, in the case of the performing arts, the variation between instances that counts toward the identity of the work produced comes from an external source, such as a remembered sound structure or from the improvisational input of the performer. In videogames, the variations are derived from the artifact itself through the act of playing.

As a result we might credibly say that videogames *artifactualize* the artistic variations also seen in the performing arts, and Carroll's definition might be saved by altering his explication of the artistic structure that is delivered by mass technology. In videogames, this is not a determinate artistic structure but a technological artifact that, when interacted with, can produce a range of such structures. The exact nature of this technological artifact will be addressed in the final section of this paper.

My rejection above of the idea that individual playings of videogames produce new art works implies that there is a further relevant difference between the performance arts and videogaming, which also partially explains that rejection. Since the variation in instances of videogames arises from an interaction with a technological artifact and not from a creative performance, the items produced are not new art works in the way that performances of jazz standards are. John Coltrane's

performance of *My Favorite Things* is an art work quite separate but obviously related to the Rodgers and Hammerstein song on which his performance is based. But with videogames, we do not consider one gamer's playing of *Grand Theft Auto IV* as meriting art work status itself, even if it is a particularly adroit playing. Largely this seems to be because we do not credit videogame players with creative intentions of the kind performance artists have, as is evident from the fact that we do not typically pick out individual playings for aesthetic praise. As Aaron Smuts notes, "the performance of a videogame is not normally evaluated aesthetically."[20] The playing of *Grand Theft Auto IV* is not itself an art work but a playing *of* an art work. In this respect, playings of videogames align with Carroll's judgment that screenings of films are not themselves artistic performances.[21]

Videogames are like films in being a mass art form and so allow for multiple instances of the game to appear simultaneously in different reception sites. And yet, they seem like jazz works in allowing for a degree of variation across instances that is not seen in traditional mass arts, even though videogame playings are not themselves artistic performances. The ontological schemas appropriate to mass arts like film and the performance arts such as jazz seem to partially overlap because videogame works, which are subject to distribution by mass technology, embody the variations that only arise in jazz works through a performance. They do so because they employ the potential of that most recent of mass technologies, the computer.

The key issue in explaining the ontological peculiarities of videogames thus seems to be how the artistic instance, playing, or token of a videogame is generated through an interaction with a technological prop. We might refer back to how such instancing occurs in other forms of mass art. Carroll noted that, though essential for explaining the notion of multiple instance art works, the type/token distinction is ultimately not "fine grained enough" to capture what instances an art work in the various arts, and that there are variations in the manner of instancing in multiple instance forms of art.[22] A theater performance, Carroll argued, is instanced by an interpretation of a script; a film is instanced by the screening of a template. In each of these cases there exists an intermediate artifact that is not itself the art work, but which is essential if the art work is to be instanced. But, to reiterate the conclusions of the this section, *Grand Theft Auto IV*, like other videogames, exists, not as a determinate artistic structure that might be rendered on a number of instances from a template or a script, but as a web of representational possibilities embodied in a technological artifact from which any number of quite distinct token artistic structures might be produced.

5. The Ontology of Videogames

What, then, is the artifactual basis of videogames that allows for this ontological peculiarity? There are a couple of false leads to avoid. First and most obviously, the relevant artifact is not the disk or digital file that is used in the distribution of the game. Physically, the playing of a game begins with acts,

such as placing a disk in a drive or downloading a file from a server, and then starting it. Increasingly, games also involve online activity, so that the origin of much of the game content derives from a location distal to its physical playing. Some online games, such as *RuneScape*, are played directly on internet browsers, employing graphical applications such as Java. The disk, digital file, or internet application is not the game but merely a means of distributing the game, and thus is a key part of the technology that lends support to the concept of videogames being mass arts.

Digitally encoded disks and downloads are means of distributing the game program, and hence it might be thought that the game itself is the program that is distributed by these means. This cannot be correct, however, because a single game can be given different program instantiations, as often happens when a game is designed to run on different hardware platforms. Moving a game from one platform to another, common since at least the 1970s, is called "*porting the game*," though for commercial reasons videogame releases are increasingly cross-platform at the outset. *Grand Theft Auto IV* can be run on PlayStation 3, X-Box 360, and a PC, and the different platform instantiations involve different programs. The differences between the varied program instantiations of the game are driven by the differing hardware and software demands of the various game platforms, both at the developer and user ends of the process.[23]

A very obvious example of the variation in hardware demands is the differences in control peripherals between different gaming platforms. On PlayStation 3, the program running *Grand Theft Auto IV* must specify the use of a game pad; on a personal computer, the program specifies a keyboard and mouse. But in either case, these control variations do not affect the videogame that is being played; rather they are ascribed to the varied programs running the game. In fact, there can be perceptible differences in single videogames as generated by different platforms. For example, a common, critical practice is the comparison of the graphics of a single game from one hardware platform to the next, comparing, for example, the graphics on *Grand Theft Auto IV* run on PlayStation 3 and X-Box 360.

As such, there must be something shared between programs that establishes game identity and hence the ontology of games. It is here that I call on Dominic Lopes' theory that games and computer art works—and videogames, which share aspects of both—are ontologically grounded in algorithms.[24] *Grand Theft Auto IV*, like chess, has a game algorithm, but where the algorithm of chess specifies the movement of pieces on a board, *Grand Theft Auto IV* involves events in a fiction.[25] An algorithm is here defined as a functional item, and as such it is useful for capturing game ontology because by being substrate independent, the functional analysis allows us to see how a game type can have multiple instantiations and can exist in different media. Moreover, algorithms can be implemented in different computer programs, thus providing an explanation for the problem noted above of how a single game might find different program instantiations across different platforms. What is shared by all is a single game algorithm.

Does this ontological posit of a game algorithm actually resemble anything that games designers would recognize in the programs they design? In fact, this broadly functional use of the term 'algorithm' does not seem to be typical of the use of the term in game design. Games designers might speak of an algorithm involved in a graphical shader, for example, but in this use they would be referring quite specifically to the transformations that allow the shader to perform its particular task in rendering the graphics, such as adding volumetric detail to a texture. Thus conceived, algorithms solve computational problems. Furthermore, algorithms are typically defined as having terminations, but the objects being invoked here can often be run indefinitely because there is no set problem that they are meant to solve. Rather their function is to generate an ongoing display drawing on the inputs of an interactor (or even without the player's input); this is often referred to as the "game loop." Thus the use of 'algorithm' as a game algorithm is applied much more grandiosely than in many technical uses, and in all likelihood would prove jarring to most game designers. It is, however, aimed at solving ontological issues, and it is not clear that games designers typically have any interest in these sorts of concerns.

Perhaps closer to this sense of *algorithm* is the term 'game mechanic,' which is used in game design to refer to the functional components of gameplay. But even this does not quite fit the broad sense desired here because designers typically speak of a game mechanic in a singular sense, as a *unit* of game design specifiable in isolation from other game mechanics, and that might find its way into a single game or be shared between different games. The use I intend for 'game algorithm' obviously refers to the conjunction of such game mechanics that combine to form a whole game. In a game like *Grand Theft Auto IV*, this collection of game mechanics is extensive.

Even given these clarifications about their functional nature, it is unlikely that the ontology of videogames can be defined solely with respect to game algorithms. Algorithms, being functionally defined, are neutral in relation to their material instantiation, and so they can be given different interpretations. The meaning of the term 'interpretation' here draws on the sense in which logical formulae in propositional logic can be given different interpretations by filling in their variables. Or to draw a sense that has a particular resonance in these ontological debates and to which I have already referred, the sense in which a theatrical play can be given different interpretations through costume, set design, and so forth.[26] In both of these cases an abstractly defined thing is given an instantiation in a material medium, and with traditional games this is the fact that allows even a single game of chess to move between media. However, with videogames the nature of the material interpretation of the game algorithm seems necessary to game identity and, so, to ontology.

Illustrating this most clearly is the issue of game "mods." Game modding involves users altering or creating new content for a game, which is then distributed so that other users can play the modified game. One example comes from *The Elder Scrolls: Oblivion*, where a popular mod added cats and rats to

the gameworld. Some games develop a significant modding community, and developers have even engaged with the modding community by giving users access to specifically designed modding tools. *Fallout 3* has done this in the form of the "GECK" (Garden of Eden Creation Kit), a level-building application downloadable from the game's official site.[27] Not only can such mods change the character or appearance of a game by making animations or textures look more realistic, or adding new monsters or objects; they can also impact the identity of the game.

The most famous such example of modding is the development of *Counter-Strike* from the first-person shooter, *Half-Life*. This interaction, even though it was with the algorithm at the basis of *Half-Life*, did not produce an instance of the game but instead an entirely new game. This is because the *Counter-Strike* mod involved the creation of a new set of artistic properties; *Counter-Strike* replaced the science fiction-themed content of *Half-Life* with a more realistic counter-terrorism military scenario. As such, the *Counter-Strike* mod of *Half-Life* is an example of how a change in the representational content has a bearing on work identity in videogames. Of course, the gameplay in *Counter-Strike* does differ from *Half-Life*, but one can imagine an even stricter mod, where an unmodified game algorithm is given a new interpretation in terms of representational properties. If the new art design of the game was sufficiently original, there would likely be little hesitation in referring to the resulting work as a new game.

The existence of game engines also bears out this ontological point. A game engine is an executive computational structure that is increasingly common in videogames, and is responsible for binding together game-mechanics, representations, control means, and their functional scaffolding into a coherent whole. Game engines are often proprietary pieces of software that facilitate the ease of production and execution of videogames. I noted earlier that we might consider videogames as "work generators" rather than as works with a number of instances, only to reject this. But some game engines come very close to functioning as work generators because they allow developers to fill in a range of representational variables, such as art and level design, in order to create original works. Again, this illustrates that representational content is a key factor in individuating works. Anyone who has played both *Fallout 3* and *Oblivion* should be convinced of this point. On its release, many people noted that *Fallout 3* was basically *Oblivion* "with guns," because the games shared the same game engine and much of their gameplay. But no one really confused *Fallout 3* for *Oblivion*. *Fallout 3* and *Oblivion* differ in their game algorithms, but one can imagine a case of a game engine also including quite specific game mechanics, perhaps consisting of generic first-person shooter gameplay, that allowed users to fill in the representational variables of character, object, environment and sound design. The result would surely be a new videogame, although a derivative one in having a generic game algorithm. One suspects that something similar is occurring in the production of videogame clones, which are videogames that hew very closely to popular precedent games, differing only in various aspects of art design.

All of these observations tease out an important ontological point, which is that although an algorithm may be necessary to videogame identity, it is not by itself sufficient. What is also necessary is that the game algorithm is 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. This artistic structure is composed of a number of discrete depictive aspects, such as polygonal 3D models, animations, virtual cameras, physics, environmental sounds and music, dialogue, 2D elements, and graphical artifacts like shaders.[28] In game design circles these are commonly called the artistic or representational "assets" or the "front-end" of the game. This is similar to a point made by Lopes, where he emphasized the importance of the "material" medium in computer art.[29] In videogaming, these materials include the impressive range of computer graphics techniques that has quickly developed over the last few decades, and in which a large part of the aesthetic interest in videogames lies. But the representational assets of games also involve more complex artistic structures, such as narrative cut scenes and large, designed 3D environments.

In fact, this functional separation between game algorithms and representational assets is often evident in practice and not only in theory. In game design practice, the game mechanics and art assets are often treated separately, so that a designer might modify a videogame to alter the character, environment, and narrative design without altering the game mechanics. This can sometimes happen very late in the design process, where building and refining the game have proceeded with graphical models that are essentially placeholders made for the purpose of the build. The narrative is often the very last piece of a videogame's artistic structure to be produced. Also, at the early proof of concept stage in game design, it is principally the game algorithm that bears the weight of evaluation. Finally, the player-character design modifications that are available to the player in *Fallout 3* and similar role-playing games also show how game algorithms are, in practice, separable from the artistic design, although in this case it is the player who is authorized to make such changes as a part of the interactivity afforded by the game itself.

This, then, is my answer to the nature of the structures crucial to the type/token relationship as it applies to modern videogames. *A videogame's artistic structure consists of an algorithm as interpreted by a set of artistic assets.* Thus two different videogames may share the same game algorithm; what differentiates them is how this algorithm is specified by artistic or representational properties. This constitutes an important difference between artistic videogames and more traditional games, such as chess, where it has been argued that representational content is inconsequential for game identity, and so a simple algorithmic theory of game ontology might actually be appropriate.[30] Furthermore, we can use this ontological theory to explain the variation in instances that make videogames difficult for Carroll's definition of mass art. I take the above analysis to imply that Carroll's definition still holds in the case of videogames but with one revision: the artistic structure in videogames is not an extant artistic structure shared between tokens but a computational artifact consisting of a game algorithm and representational assets

that can produce a range of such structures through the input of the player.

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Endnotes

[1] The nature of videogames as art is discussed in some depth by Aaron Smuts, "Are Video Games Art," *Contemporary Aesthetics*, 3 (2005), Grant Tavinor, *The Art of Videogames* (Malden, MA: Wiley-Blackwell, 2009), and Dominic McIver Lopes, *A Philosophy of Computer Art* (London: Routledge, 2009).

[2] Richard Wollheim, *Art and Its Objects* (Cambridge: Cambridge University Press, 1980); Nicholas Wolterstorff, "Toward an Ontology of Art works," *Nous* 9 (1975); Amie Thomasson, "The Ontology of Art," in *The Blackwell Guide to Aesthetics*, ed. Peter Kivy (Malden, MA: Blackwell, 2004).

[3] Wollheim, *Art and Its Objects*.

[4] Noël Carroll, *A Philosophy of Mass Art* (Oxford: Clarendon Press, 1998), p.196.

[5] Carroll, *A Philosophy of Mass Art*, p. 196.

[6] Carroll, *A Philosophy of Mass Art*, p. 199. There is a complication here that is worth mentioning. In multiplayer *Grand Theft Auto IV*, the game allows different players to play against each other, so that they can all play a single game even where they may exist in geographically isolated reception sites. For the sake of simplicity, in this paper I refer to single player games only, even though the ontological issues with multiplayer games might be interesting in their own right.

[7] Games scholar Jesper Juul has recently written of the increasing attempts by games developers to address this inaccessibility through the production of what are called "casual games," which are games that can be picked up and played on first contact without a significant investment of skills and learning demanded by hardcore games; Jesper Juul, *Casual Games: Reinventing Video Games and Their Player*s (Cambridge: MIT Press, 2009).

[8] Carroll, *A Philosophy of Mass Art*, p. 196, pp. 227-228.

[9] On the combination of gaming and art, see Tavinor, *The Art of Videogames*.

[10] Wollheim, *Art and Its Objects*; Carroll, *A Philosophy of Mass Art*; Dominic McIver Lopes, "The Ontology of Interactive Art," *Journal of Aesthetic Education*, 35, 4 (2001), 65-81.

[11] Stephen Davies, "The Ontology of Musical Works and the Authenticity of Their Performances," *Nous*, .25, 1 (1991) 28-29.

[12] For an example of an ontological theory of art works (in this case musical works) that takes such genetic factors to be essential to the identity of works, see Jerrold Levinson, "What a Musical Work Is," *The Journal of Philosophy*, 77, 1 (1980), 5-28.

[13] Berys Gaut includes videogames among the cinematic arts for this reason; *A Philosophy of Cinematic Art* (Cambridge: Cambridge University Press, 2010). Videogames also involve tactile or *haptic* display elements, so they are not merely audio-visual presentations. Tavinor, *The Art of Videogames*, pp. 61-62.

[14] It may be the case that not all videogames are fictions; see Grant Tavinor, "The Definition of Videogames," *Contemporary Aesthetics*, Volume 7 (2008).

[15] For details of how videogames encode their gameplay in terms of their fictions, see Tavinor, *The Art of Videogames*, pp. 86-109.

[16] There are genuinely different versions of *Grand Theft Auto IV*. For example, in Australia, due to concerns with the adult nature of some of the games by the media ratings board of that country, certain depictions of sex were removed from the version of the game released there.

[17] Carroll, *A Philosophy of Mass Art*, p. 201.

[18] Phillip A. Lobo, "So This Is What the Dream is Like: Violence and Assimilation in *Grand Theft Auto IV*," in *Open Letters* (2009), accessed 1 June 2010, archived at http://openlettersmonthly.com/issue/video-game-review-grand-theft-auto-iv/"> openlettersmonthly.com/issue/video-game-review-grand-theft-auto-iv/.

[19] Stephen Davies characterizes this difference as that between the ontological "thickness" and "thinness" of a given musical form. Stephen Davies, *Musical Works and Performances* (Oxford: Oxford University Press, 2001).

[20] Aaron Smuts, "Are Video Games Art?"; *Cf*. Lopes, "The Ontology of Interactive Art," p. 80.

[21] Carroll, *A Philosophy of Mass Art*, p. 213.

[22] Carroll, *A Philosophy of Mass Art*, p. 212.

[23] Complicating this picture is the fact that there are "portable" programming languages that are hardware abstract.

[24] Lopes, "The Ontology of Interactive Art" and *A Philosophy of Computer Art*. On games as algorithms, see also Jesper Juul, *Half-Real* (Cambridge, MA: MIT Press, 2005).

[25] Tavinor, *The Art of Videogames*, pp. 92-102.

[26] Carroll, *A Philosophy of Mass Art*, p. 212.

[27] http://geck.bethsoft.com/index.php/Main_Page , accessed

30 April 2011.

[28] Tavinor, *The Art of Videogames*, pp. 61-85.

[29] Lopes, *A Philosophy of Computer Art*, pp. 64-66.

[30] *Cf*. Juul, *Half-Real*, pp. 12-15.