

STONE+LIFE=EGG – *Little Alchemy* as a limit-idea for thinking about knowledge and discovery in computer games

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Abstract

In this paper I will discuss, by building on post-phenomenological philosophy of technology, existential ludology, and game studies, the conditions of possibility for discovery in computer games and present a sketch for a model of three ‘levels of discovery’ in computer games: discovery of that which we *can* do, of that which we *need* to do, and, of what we *want* to do.

Introduction

Building on post-phenomenological philosophy of technology, existential ludology, and game studies, in this paper I will discuss the conditions of possibility for making discoveries in computer games. I will ask: how can we describe computer games as affording players making discoveries in the game, experiencing these as significant, and sharing them with other players?

Outline of the paper is as follows. Before I get to the question regarding the kinds of discoveries, it is necessary to briefly address the question of how we can describe, in a post-phenomenological framework, the possibility of sensing, perceiving, and knowing about computer games. This amounts to discussing computer games as “epistemology engines” (Ihde 2002) and involves addressing the separation between a ‘game’ and its ‘interface’, which must be made in order to gain the much-needed specificity regarding how computer games situate in Ihde’s (1990) framework human/technology relations (e.g. Payne 2008; Hammar 2013). The separation appears initially problematic, as the two terms, ‘game’ and ‘interface’ are inextricably intertwined, and can only be considered as a relationship between each other, very much like ‘body’ and ‘world’.

To account for the relationship between the ‘game’ and its ‘interface’ and their role in knowing about the game I will consider the game/interface union as a ‘lived game interface’ to describe the computer game as an Ihdean epistemology engine: simultaneously as an object and a mode of perception, or in other words, that which we perceive, and that which allows us to perceive itself

through itself. Within the lived game interface as a “unified field” (Bullington 2008), we may, on an empirical case-by-case basis, describe the ‘game’ and the ‘interface’ as separate “sectors”. The notion of ‘lived game interface’ functions also as a description of the conditions of possibility for intersubjectivity (Sokolowski 1999) in computer games.

To account for the discoveries which happen within the ‘lived game interface’, I turn to Pickering’s concept of “ontology engine” to explore how computer games exemplify ontologies and afford making discoveries about the ontologies they exemplify. My focus here are not the exact ontologies computer games exemplify. Instead, I will attempt to describe the ways in which they can exemplify *any* ontology. Neither I am interested in individual discoveries made by players, but instead in describing the ways in which games afford players making discoveries of any sort, and, the ways in which they may allow the player to strive for self-realization by building on their discoveries.

By discussing examples of *Little Alchemy* (2013) and *DayZ* (2013), I argue that these ways range from games as merely instructive of someone else’s idiosyncratic ontologies, to games as being able to not only help us to think about relations between objects, but also to practically experiment with these relations (compare: Gualeni 2014), and perhaps even to authentically ‘own’ these relations by risking our existence in order to forge new, possibly unique relations and assemblages, and, to meaningfully share these discoveries with other players. I will summarize these kinds of discovery into three ‘levels of discovery’: of that which we *can* do, of that which we *need* to do, and of the possibility of doing what we *want* to do. I will also discuss the kind of ‘play’ that these discoveries are associated with.

Since not all computer games afford making all three kinds of discovery, and not all the players realize the potential for discovery in a particular playing of a particular game, these ‘levels’ and the corresponding kinds of ‘play’ have potential for critical and comparative analysis of games and their playings. The affordance or in-affordance of these kinds of discoveries in a game also casts a different light on the ‘author’ of the game, and thus the ‘levels’ can also be considered as contributing to the debate regarding game design a “dialectical” process (e.g. Wilson & Sicart 2010).

The lived game interface as an “epistemology engine”

Ihde (2002, see also Ihde & Selinger 2004) has introduced the term “epistemology engine” as referring to technologies, which are significantly involved in or even make possible particular ways in which humans can know about the world. A camera obscura, a telescope, or, the Large Hadron Collider (LHC) at CERN might be examples of such epistemology engines. How would the notion of ‘epistemology engine’ work for talking about discoveries in computer games?

To consider computer games as ‘epistemology engines’ involves first positioning them within the intentionality relations framework. In contrast to multi-player games, which can be, at the outset, described as allowing players to perceive each other and as mediating the interactions

between them, single-player games do not necessarily afford new ways of seeing the world – they do not mediate an experience between the human and the world outside the game. (In special cases, however, e.g. in situations where Galloway’s [2004] “congruence requirement” is fulfilled, or the “simulation gap” [Bogost 2008] is bridged, this may not be the case, and the game artifact might indeed mediate between the human and the world, very much like a documentary movie could do) Thus, within the framework of intentionality relations single-player computer games, together with fridges, vending machines, and other technologies in which our experiences ‘terminate’ (Verbeek 2008, 389), fall initially into the category of alterity relations (Ihde 2002, 81; Leino 2013), appearing as “focal quasi-other[s] with which I momentarily emerge” (Ihde 1990, 107).

In an attempt to gain more specificity, we may consider attempting to tear apart the “game” and its “interface” (or, as Hammar [2013, 2] suggests, the "the game's virtual environment" and the "technology required to execute and present the digital game and its virtual environment in question", although that distinction would lead us to losing track of the ‘game’ as the primary locus of significance in the situation). The former we could consider as appearing as in an alterity relation, and the latter as the appearing in relations of mediation, and responsible for making it possible for us to sense, perceive (Wirman & Leino 2008, 462), and thus know about the game. More specifically, in this formulation, the interface would appear in “hermeneutic mediation relation” (Ihde 1990, 80—89) (e.g. the components of on-screen interface, whose successful interpretation is a precondition for mediation of experience from the ‘game’ to the player) and “embodied mediation relation” (Ihde 1990, 72—80) (i.e. the mouse, which is incorporated in the player’s body-image as an extension of the hand). This constellation of the interface and the game, while not necessarily letting us perceive or teaching us anything about the world outside the game, could perhaps be referred to as an ‘epistemology engine’.

However, in addition to distinguishing the interface and the game (world), it is necessary to describe also how they are interrelated and in doing so recognize their inseparable intertwinement. Two observations follow. First, we cannot experience the actual interface ‘in itself’ as separate from the game but always as an interface ‘onto’ or ‘about’ a particular game world. (Although we may think of ‘ideas’ of interface shared by different games, as in the case of the interface conventions of e.g. a minimap, or WASD + mouselook scheme.) Note that considering the ‘interface’ as referring to mouse, keyboard, screen, joystick, and other such things which persist even if we change the game would not help us: ‘mouse’ alone would be a different “technological artifact” (i.e. that which becomes what it ‘is’ through its uses, as Ihde [1990, 70] suggested) than for example a ‘mouse-being-used-for-aiming-in-*Call of Duty 4*’. Thus, we note that the game interface has its own directedness, aboutness, or perhaps even its own ‘constitutive intentionality’ (Verbeek 2008) (comparable to using a radiotelescope to perceive a faraway planet which could not be perceived without a telescope) toward the game (world). Second, ‘through the interface’ is the only way in which we can access the game (world) as players: thus, also the game (world) exists only in relation to the interface.

Thus, we may suggest, perhaps in line with Jørgensen (2013) who writes about “the game-world interface”, that it does not seem productive to consider the two as anything else but inseparably intertwined. Furthermore, we may note that the special relationship between them seems to resemble how in Merleau-Ponty’s (2002) notion of ‘lived body’ the mind, body, and the world are intertwined, described by Bullington (2013, 26) as follows:

“These realms are to be understood as levels, intertwined with each other, constituting a unified field. The self, the body and the world of things and others are neither separated from each other nor to be confused with each other, but rather can be seen as three sectors or levels of a unique field.”

Consider examples of wearing the ‘HEV Suit’ in *Half-Life 2* (2004) for the first time and thus enabling the on-screen overlays or in other words allowing the ‘playing I’ to sense the game (world) around them, or, the effects of a flashbang grenade in *Call of Duty 4*, making the screen white and emitting a high-pitched noise, or, in other words, disabling the senses of vision and hearing in the body of the ‘playing I’ (Leino 2010, 169—177). It is correct to note, like Payne (2008) and Hammar (2013) have done, that placing computer games into the category of alterity relations alone would lead to a rather low-resolution image of the situation, and, would thus not do justice to the complexity of human/technology relations at play: the difference between, for example, *Half-Life 2* before and after wearing the HEV Suit is significant enough to call attention to the ways in which our experience is not only mediated, but also “co-shaped” (Verbeek 2008; Leino 2010, 169—177) by the playable artifact. In these cases, we can analytically distinguish between what is the ‘interface’ and what is the ‘game’, as “levels” or “sectors” (Bullington 2013, 26) of the field that is the ‘lived game interface’ in *Half-Life 2* or *Call of Duty 4*. However, instead of seeking to theorize the border of the game and the interface from these examples, I will rather suggest that perhaps the question concerning the border between the ‘game’ and the ‘interface’ within the lived game interface is an empirical and experiential rather than a philosophical question, and as such to be decided upon on case-to-case basis.

Following how Sokolowski (1999, 53) sees the unity of body and world as involved in the possibility of intersubjectivity, we can also describe the ‘lived game interface’ as a basis for intersubjective understanding in and of computer games: On the one hand, in-game intersubjectivity is possible due to the game “world held in common” (Sokolowski 1999, 53) by the players: we can “appreciate the object as so transcending my own viewpoint: I see it precisely as being seen by others and not just by me.” On the other hand, like “the experience of another self is based on the experience of another body as like our own”, in-game intersubjectivity is possible due to the fact that other players perceive the ‘game (world) held in common’ through an interface like that we perceive the game through.

Games as “ontology engines”

As mentioned above, only in special cases (Galloway 2004; Bogost 2008), there may be a relation from the game to the world outside the game. Excluding these special cases, the player-game relationship thus undeniably has the character of alterity relation, in the sense that nothing from the world outside the single-player game is being mediated into the player’s experience. The situation of making discoveries in a single-player computer game is a situation where the object to be discovered through the human-technology relationships is the technology itself. To account for the ‘technology itself’, we might follow how Schoonhoven (2007, 12) describes computer games as being real:

“virtual reality technologies exists inside reality, and in this sense, virtual realities are ontologically also part of reality as a whole. The computer generated virtual worlds are not something paranormal, they physically exist as electrical currents and magnetic fields inside computer circuits.”

In this view, we might then conceptualise the ‘lived game interface’ as mediating an experience about the ‘computer circuit’. Cheyenne, a pet dog in *Fallout: New Vegas*, as it appears on the screen as an image and as part of gameplay, could be traced to the code of the game, its execution involving memory register allocations, electrical currents going through gates on the microchips soldered on the motherboard, atoms, and quarks. However, in doing so we would (again) lose track of the ‘game’ as the primary locus of significance in the situation.

To find an alternative that allows talking about the game artifact simultaneously as the focal quasi-other and as mediating experience onto itself, without losing track of the ‘game’ as the primary locus of significance in the situation, I turn to Pickering (2006, 213—218), who, in a commentary of Ihde’s notion of epistemology engine, explores the possibility of conceptualising technologies not as shaping the ways we can know of the world (“deceiving us about epistemology”) but as “ontology engines”, as instructive devices which exemplify ontologies.

In Pickering’s (ibid.) view, Ihde’s project assumes that the “point of our being in the world were to represent the world to ourselves, rather than the unavoidable project of getting along materially.” Pickering’s example is a system of multiple interconnected homeostats, exemplifying his idea of “dance of human and nonhuman agency” as a fundamental feature of his understanding of how humans, objects, and technologies are interrelated. Pickering (ibid.) notes that the “multihomeostat system”, as an ontology engine exemplifying a cybernetic understanding of interrelations, “stood just as readily for itself (a collection of inanimate electromechanical parts), an adaptive autopilot flying a plane, the British economy and the evolution of biological species. Homeostat assemblages could, then, serve as models of all aspects of the world, including aspects from which humans were simply absent.”

With this in mind, I set out to explore the possibility of describing that which we, as players, encounter in the alterity relation between the player and the game, is the game as an “ontology engine”, exemplifying an ontology which may (Galloway 2004; Bogost 2008) or may not be relevant in relation to our knowledge of the world outside itself. Let us explore this idea first through the example of *Little Alchemy*, then through *DayZ*.

Dog + Ice = Husky: Discovery of ontology in *Little Alchemy*

Little Alchemy (2013) is a game in which the player is to combine icons representing concepts, objects, substances, and elements (items, in short) to discover more items. Valid combinations result in a new item appearing in the inventory, waiting to be combined with something else. There are 550 different items for the player to discover, including for example ‘Air’, ‘Volcano’, ‘Life’, ‘Motorcycle’, ‘Platypus’, ‘Sheet Music’, and ‘Solar System’. To complete the game, the player must discover and execute all the possible combinations. Nothing happens if an invalid combination is attempted – the ingredients simply remain overlapped on the workbench. After all 550 items have been discovered, the player can continue to re-create the same items over and over again. There is no time limit, or risk of failure or death.

While the interface of *Little Alchemy* functions according to a logic that is easy to grasp and persists regardless of the combinations we are attempting to achieve – player is invited to drag items from inventory on the right side of the screen to overlap with each other on the workbench on the left side of the screen – same cannot be said about all the combinations themselves. Some of the valid combinations are quite commonsensical if not even following the combinatory logic of things in the world in general, while others communicate a rather idiosyncratic understanding of relations between things. Combining a ‘Fish’ and a ‘Human’ to produce a ‘Mermaid’, or, ‘Ice’ and ‘Tea’ to produce ‘Iced Tea’ both appear somewhat understandable, but the same cannot be said about combining ‘Ice’ and a ‘Dog’ to make a ‘Husky’, or ‘Stone’ and ‘Life’ to produce an ‘Egg’. The only logic governing the relations between items appears to be the lack of any formal logic whatsoever.

We may briefly consider the Japanese comedian and singer Pikotaro’s popular song “PPAP”, which also implies a slightly weird understanding of relations of things. While following the logic of combining an ‘Apple’ and a ‘Pen’ into an ‘Apple-Pen’, and, a ‘Pineapple’ and a ‘Pen’ into a ‘Pineapple-Pen’, combining ‘Apple-Pen’ and ‘Pineapple-Pen’ should result in ‘Apple-Pen-Pineapple-Pen’. However, the resulting combination is instead ‘Pen-Pineapple-Apple-Pen’. The logic of the combination is initially unexpected, but can be understood as a result of a “procedural” (Bogost 2008) or “algorithmic” (Galloway 2006) logic guided by the overarching constraints of rhythm and rhyming. *Little Alchemy*, in contrast to PPAP, does not have an overarching structure to explain the logic behind possible combinations, which would allow us to predict possible combinations.

Brute force can be an effective way of cracking the idiosyncratic ontology in *Little Alchemy*, as the user MaBustback writes in their comment on littlealchemyguide.com: “I’ll put as many of something on it and mix it all up.” (sic!) However, a successful combination made at random is likely to result in a revelation. Consider this example the first combinations the player can make using the initial set of items (‘Earth’, ‘Fire’, ‘Wind’, and ‘Water’) appearing in the inventory at the beginning of the game. Whereas combining ‘Air’ and ‘Air’ results in ‘Pressure’, combining ‘Water’ and ‘Water’ results in ‘Sea’. That is hardly logical, but nevertheless, after having made the combination, player can’t help thinking: ‘I should’ve guessed that!’ The combinations are sometimes weird, but not random – especially *post factum* they appear to make sense, and seem symptomatic of having been designed by someone or something grounded in a particular culture; consider for example ‘Jack’o’Lanterns’ (‘Blade’ + ‘Pumpkin’), Fairytales (‘Dragon’ + ‘Story’), and ‘Christmas Stockings’ (‘Wool’ + ‘Fireplace’). It is noteworthy that the items in *Little Alchemy* have no uses other than being combined with specific other items. There is no potential in terms of developing one’s skill or achieving anything unique – *Little Alchemy* is all about executing the pre-determined plan. Once the player becomes aware of the “essential poverty” (Sartre 2002 [1940], 7-8) of *Little Alchemy*, resulting from the pre-determined nature of the possible combinations and the lack of meaningful personal choice, the game quickly transforms into resembling a crossword puzzle, or perhaps a riddle, (cf. Karhulahti 2013), in respect to the player’s task being only to second-guess the designer’s idiosyncratic ideas from the clues presented. The discoveries the player of *Little Alchemy* is making are not unique to herself, everyone will make the same discoveries of the course of the 550 combinations making up the game. The player’s task in *Little Alchemy* is to execute all the possible combinations. Once the player has learned the ontology of *Little Alchemy*, the game is over. As an “ontology engine” *Little Alchemy* does indeed exemplify an ontology – someone’s or something’s vision of relations between things, an idiosyncratic ontology.

Not all games are, ontology-wise, as simple and pre-defined as *Little Alchemy*, but perhaps *Little Alchemy* is useful reference point to which we can compare other games to highlight their features. This move would be similar to Ihde’s (1990, 11-20) use of an imagined concept of a paradise, the habitat of Adam and Eve, as something to which situations from contemporary lifeworld can be compared to to highlight the contribution of technology in the constitution of lifeworld. So, in the following, let us consider *Little Alchemy* as an exemplification of a “limit-possibility”, allowing us to take a “a leap that will serve a recurring heuristic purpose” (Ihde 1990, 11).

On horticulture and being beaten to death on Skalisty Island: Discovery of instrumentality in *DayZ*

Consider *DayZ* - an open-world survival game in which the player’s task is to scavenge items from abandoned houses and use them to stay alive in a world infested with zombies and other players.

When I played *DayZ* for the first time, the character spawned on a beach, thirsty and hungry. Not knowing that apples can be foraged from trees to still the pangs of hunger, or, that thirst can be quenched with water pumped from wells behind houses in villages, I saw the colours on the screen fading into greyscale, soon to be replaced with the text “You are unconscious”, followed with “You are dead.” Before even encountering any other players, the resistance of *DayZ* got me. This kind of death happened a few times.

Then the character spawned on a beach again, by a bay on the other side of which I saw what looked like ruins of a castle on top of a hill. Not knowing if characters in *DayZ* could swim, I decided to take the plunge and try to swim to the other side. Swimming went well, and soon I was ashore underneath the hulking ruins. I climbed the mountain to find nothing interesting in particular within the ruins, but from the top I could see that the landmass I was on was actually an island with a half-sunken ship and few houses. (Later, reading a map I learned this was the Skalisty island in the South-Eastern corner of Chernorus)

I trekked to these houses and found a well in front of the house and learned to quench my thirst. Inside the houses, among other things I found a can-opener and some canned food. Having covered the basic needs, I set out to explore the immediate vicinity of these houses. In a shack I found a bag of fertilizer, some seeds, and a farming hoe. In my collection of items I already had a cooking pot. I discovered the possibility to use the hoe to dig up soil to prepare a garden patch, to plant the seeds in the patch, and to water them with water carried from the well in the cooking pot. This resulted in seven tomatoes, which satisfied my hunger at the time. While waiting for the plants to grow, I explored the nearby houses again, to discover that new items had appeared in the place of those I had previously picked up and quickly settled into a routine of going through the usual item spawn-points at regular intervals. I was able to keep the things I found behind locked door of one of the houses, as I had found a lockpick and discovered it can be used to lock up buildings. I thought I had it all laid out in front of me, that I had found a way to cope with the resistance of the world: to keep farming for food, drink water from the well, and patrol the nearby houses and shacks to pick up new bags of seeds and other items appearing there.

Then, as I was sitting on the porch of the house, looking at the horizon over the sea, a stranger appeared, in t-shirt and jeans only, those being telltale signs of the stranger having only recently spawned. Not really knowing my way with the controls of games of the first-person shooter type (“kinaesthetic challenge” [Karhulahti 2013] of *DayZ*), I was unable to defend myself in the heat of the moment. The stranger beat me down with their bare fists. The familiar “You are unconscious” text appeared. I then regained my consciousness for a brief moment, to see the stranger as a mirror-image of myself, wearing all the clothes and equipment taken from me while I was unconscious, with the farming hoe raised to finish me with one final blow. “You are dead.”

Apparently I was misguided. My assumption of having it all laid out in front of me had been false. Skalisty Island is not a safe place to practice horticulture in the fashion described above. While my beliefs regarding the objects and their relations were correct: farming hoe, fertilizer,

tomato seeds, and a garden plot can be used together to create food, and the pump gives water to quench the thirst. However, by being beaten to death I discovered that in *DayZ*, axes, guns, and bullets are more important objects than tomato seeds and fertilizer. A farming hoe is somewhere in between. What does this experience of being misguided on Skalisty island tell us about ontological knowledge and discovery in games in general? At least two things.

First: whereas *Little Alchemy* ended when the ontology had been discovered, we can observe that I was really able to “play” *DayZ* only after discovering ontology (e.g. apples, wells). Second: we can also observe that I discovered not only objects and their relations, but also the instrumental-rationality that these relations are pregnant with (e.g. farming hoe is a coefficient of utility in my hands if I’m farming and coefficient of adversity in the hands of a hostile other) Let us compare the relations between objects in *Little Alchemy* and *DayZ* to get at this instrumentality.

Backpacks in *DayZ* (2016) come in all shapes and sizes, ranging from a small, schoolbag-like, ‘Child’s Briefcase’ (12 item slots) to a ‘Mountain Backpack’ suitable for carrying the necessities for an extended stay in the wilderness (35 slots). If a backpack is nowhere to be found, but the player has access to a ‘Burlap Sack’ and some ‘Rope’ she can combine these items to create an ‘Improvised Courier Bag’ which, like the ‘Child’s Briefcase’, allows for 12 slots worth of items to be stored.

Discovering the possibility of creating an ‘Improvised Courier Bag’ in *DayZ* is not any more unique discovery than is the discovery of combining ‘Ice’ and ‘Dog’ to make a ‘Husky’ in *Little Alchemy*. Supposedly everyone who spends time with *DayZ* will create an ‘Improvised Courier Bag’ at some point. Like in *Little Alchemy*, also the combinations of items in *DayZ* can be used for recombinations. If, after creating the ‘Improvised Courier Bag’, the player stumbles upon three pieces of ‘Wooden Stick’, these can be combined with the ‘Improvised Courier Bag’, to create an ‘Improvised Backpack’, which has a more generous 20-slot storage allowance.

However: in *Little Alchemy*, the ‘Husky’ is at the end of the line and cannot be combined with anything else. Once discovered, the ‘Husky’ is useless. The case of objects in *DayZ* is quite the opposite. In *DayZ* objects have purposes that are beyond being used for pre-defined recombinations: already the ‘Improvised Courier Bag’, even if we do not further craft it into a ‘Improvised Backpack’, has potential to be used, in countless ways, to postpone death. To survive in Chernarus – the world of *DayZ*– a bag of some kind is essential. Without a bag, the player has only the pockets of her clothing to carry things in, and will certainly struggle to carry all the food, drink, ammunition, and other such items she needs for survival.

The combinatory discoveries in *DayZ* are no more unique than in *Little Alchemy*. *DayZ*, too, exemplifies an idiosyncratic ontology designed by someone. However, the fact that the object-relations we discover have uses, allows their significance to transcend the idiosyncratic ontology within which we initially discover them. The object-relations in *DayZ* exist not for the purpose of being used in uncovering someone else’s idea of relations between things – as would be the case

in *Little Alchemy* – but for the purpose of being used in survival, i.e. in the ‘gameplay’ of *DayZ*. If everything makes sense and works out well for us, as is the case in *DayZ*, we can describe the object-relations as ‘transparent’: we tend to forget who put the object-relations there in the first place. On the contrary, the object-relations in *Little Alchemy* are ‘opaque’, as they refuse to submit to any overarching structure from which to lend significance, and thus refer those in search for meaning to the (implied) designer-author of the game. This appears to resonate with the ideas of Wilson & Sicart (2010) concerning “abusive game design” as a dialectical practice: perhaps *Little Alchemy* could be described as ‘ontological abuse’.

From discovery to survival to the possibility of self-realization

Let us now attempt to summarize what has been said about discovery and play in computer games so far. To facilitate this summary, consider how Gilead (2014), when discussing scientific discoveries, distinguishes between “makes a distinction between two kinds of discoveries: of “pure possibilities”, and, of “actualities.” Gilead further notes that “the second kind of discovery depends on the first kind. To discover new actualities we have to discover their pure possibilities-identities first or, at least, not to exclude these possibilities but to admit them, knowingly or unknowingly.”

We can describe a first level of discovery. Computer games teach their players what *can* be done in the game: players will discover what kind of objects there are in the game world, how are they related to each other. We may refer to this discovery as the “habituation” (Gallagher & Zahavi 2008, 138) into the ‘lived game interface’, i.e. the incorporation of the possibilities for action afforded by the game into the the playing-bodily ‘I can’ (Vella 2015, 174—184). In some games, making this kind of discoveries is facilitated by an interface tutorial, providing the player with at-a-glance view of what different objects are, and how to manipulate them. This is the first kind of discovery: of the ontology implied in the game.

In light of Gilead’s (2014) distinction between possibility and actuality, while the lack of overarching logic behind the combinations of *Little Alchemy* prevents us from discovering the possibilities before actualities, we may observe that having made a ‘Jack-o-Lantern’ from a ‘Pumpkin’ and a ‘Knife’ in *Little Alchemy*, we are likely to not exclude the possibility that perhaps a ‘Sock’ and a ‘Tree’ could be made into a ‘Christmas Tree’. Thus: we can discover possibilities only in a somewhat vague sense, by not excluding them, possibly based on what we imagine of the author and their intentions. If, following Gilead, the discovery of possibility is a necessary requirement for discovering actualities, we may observe that only in a benevolent description we can consider *Little Alchemy* as affording even the first kind of discovery. This is perhaps not surprising, as Karhulahti (2013) suggests that the possibility for a separation between the idea of a solution and an execution of a solution is the necessary condition for something to be a puzzle. Thus, perhaps due to there being no overarching logic behind the combinations that would allow developing ideas for solution, *Little Alchemy* is not a puzzle but rather an insoluble riddle.

We can describe a second level of discovery. Computer games teach their players what *needs* to be done in the game. Knowing what objects there are, and what can be done in the game, allows the players to further discover how the objects can help them to postpone death – how the in-game objects, events, and encounters are situated in an instrumental-rational ontology. Not only can an ‘Improvised Messenger Bag’ be created from ‘Rope’ and ‘Burlap Sack’, but the ‘Improvised Messenger Bag’ can be used to carry items essential for survival. This is the second kind of discovery: the instrumental-rationality in the ontology in the game.

Let us look further into the origins of this instrumental-rationality. In *DayZ*, like also in many other ‘computer games’ ranging from *Tetris* (1985) to *The Sims 2* (2004) and *Cities: Skylines* (2015), there is no “goal” (Juul 2007), i.e. something the player is supposed to achieve, except “to not die”. Thus, the only goal we can describe in *DayZ* is to (be able to) keep playing. My challenge is to meet the demands of the game and thus stay alive. This is ‘gameplay’ in a strict Gadamerian (2004, 105) sense of the word: “the one who tries, is the one being tried.” These discoveries of instrumental-rationality in object-relations are subordinated to the “gameplay condition” (Leino 2010, 126–133), i.e. the necessity of meeting the demands of the game in order to not end the activity of play, and are thus characterized by “tension” (Huizinga 1980, 10-11), where “tension means uncertainty, chanciness; a striving to decide the issue and so end it. The player wants something to ‘go’, to ‘come off’; he wants to ‘succeed’ by his own exertions.”

Little Alchemy does not afford making of discoveries pertaining to instrumental-rationality, because in the object relations in *Little Alchemy* there is no instrumental-rationality. As *Little Alchemy* does not afford failure (even in the sense of ‘being stuck’, as only trivial effort of combinations by brute force is needed to create a new combination allowing progress in a situation where it was not possible before), we cannot describe the discoveries in *Little Alchemy* being motivated by a gameplay condition.

DayZ stands in interesting contrast to *Little Alchemy* in this regard. In *DayZ* the actual ‘gameplay’ consists of, on the one hand, making the second kind of discoveries (finding new ways of using objects to survive) and overcoming the “kinaesthetic challenge” (Karhulahti 2013) of implementing these. In terms of Gilead’s (2014) distinction, this challenge is in between discovering a possibility and discovering its actuality. In some cases the end of the second lesson, i.e. having solved the “tension” and turned the possibilities into actualities, marks the end of the game (cf. Aarseth’s [2004, 51] notion of being “unemployed” at the time of game over), but in others it with it opens an opportunity to take the play-activity to a new level. The second kind of discovery gives rise to one more kind of discovery.

Let us imagine a scenario in which I attempt to continue my farming practice on Skalisty Island, with the newfound knowledge of the challenge it implies. I could, for example, establish an arsenal of weapons for defense, and, with the help of my friends, arrange regular air-drops of ammunition and other supplies from the inland areas of Chernarus, where high-value objects are plentiful. This kind of play of activity can start to unfold only after I have become aware of the

requirements of survival and decide that I am equipped well enough to deal with the resistance of the artifact to take on a project of my own, rather than the game's, choosing. This kind of play takes on a character resembling the playing of an instrument. (Elsewhere [Leino 2010, 126—133] I have referred to the difference between these two kinds of play as a difference between “playing the game” and “playing with” the game.)

We can now describe a third level of discovery. Computer games teach their players how to do what they *want* to do in the game. Knowing how to use the objects in the game to survive the resistance of the game allows the players to discover the possibility of authentic self-realization in the game – how to pursue their personal preferences in the game. This is the third kind of discovery: of the possibility of self-realization, what the player *wants* to do. This might be for example to establish their own style of playing, e.g. by adopting “creative takes on the things that you thought were only performed one way”, as suggested by the PAPA World Pinball Champion Cayle George (Pavlopinball.com 2015), clear lines of blocks made of one colour only in *Tetris*, to farm on Skalisty Island in *DayZ*, or, to build a 16-bit computer in *Minecraft*. The third level of discovery is the discovery of the possibility of reclaiming play from the game. It marks a shift from play driven by an “instrumentalist rationale” (Henricks 2006, 193; Leino 2014, 9), i.e. play as ‘working for the game’, or, as “instrumental play” (Sicart 2011) to play as self-determined, autotelic, maybe also creative, improvisational, and expressive: i.e. play as described through the ‘romantic’ lens of classical play theory (Möring & Leino 2016).

Noteworthy here is that perhaps the significance of play as self-realization does not depend on its success. We can describe the significance of ‘play as self-realization’ as located between having discovered the possibility for self-realization (“knowing what I want to do”), and, striving to discover its actualization (“having done what I wanted to do”). It is not without tension or challenge either. Maybe the 16-bit computer may not get built, or, the plants will wither next to a corpse stripped from all its belongings.

However, the challenge and tension that characterize the striving to turn the 3rd discovery of possibility into an actuality emerge independently from the game artifact – thus the relationship between possibility and actuality in 2nd and 3rd kinds of discovery are significantly different. Here it is up to the player to define what counts as “success” and what does not. Even if I was able to clear a line of one colour of blocks only in *Tetris*, it would go unnoticed by the game artifact. In relation to the gameplay condition in *Tetris*, the third discovery is insignificant, and its meaning is that given by the player through their choices and actions (not unlike Sartre describes meaning of life). However, this kind of discovery is not without intersubjective significance: even if they have not made similar 3rd-level discoveries themselves, those who know the gameplay condition in *Tetris* can relate to the pursuit of fleeting beauty in a world characterized by ever-accelerating repetition, as can those who know the gameplay condition of *DayZ* to experience of farming in a world characterized by zombies and permadeath.

Conclusions

Now we have described three levels of discovery in games, which can be summarized as follows:

- Discovery of in-game ontology: what objects are there, how are they related – what I *can* do in the game
- Discovery of instrumental-rationality: how the objects help me to postpone death – what I *need* to do in the game
- Discovery of the possibility of self-realization: how the game allows me to pursue my personal preference – what I *want* to do in the game.

Thanks to the possibility for intersubjectivity inherent in the ‘lived game interface’, we can assume that these kinds of discoveries made in a particular game resonate with the experiences of other players and playings of that game. What is presented above as ‘levels’ are supposedly intertwined and players may move back and forth between them in circular fashion reminiscent of the hermeneutic circle. Every new level of discovery casts new light on the discoveries made on the previous level, possibly rendering useful something that was before considered obsolete – in this sense movements between the levels seem to resemble Kuhnian idea the structure of scientific revolutions.

Noteworthy also is that not all games afford making all three kinds of discovery, and, not all players or playings realize the full potential of discovery in a game. Thus the ‘levels’ may have potential for critical and comparative enquiry. Implementation of this plan beyond what was done already in the comparison between *Little Alchemy* and *DayZ* is unfortunately outside the scope of this paper, but supposedly interesting similarities would emerge between *Little Alchemy* as an insoluble riddle, and for example story-based “games of progression” (Juul 2003).

The presence of the third kind of discovery, and the kind of play associated with the third kind of discovery, casts a critical light on the idea of using the notion of ‘play’ to describe the activities we engage in with computer games. Perhaps only some computer games afford the third discovery, and the kind of play associated with it – the kind of play which classical play theories imbue with healthy qualities, and, perhaps the majority of contemporary computer games afford only the first two kinds of discoveries. (see also Möring & Leino 2016).

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