Attention, videogames and the retentional economies of affective amplification

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Abstract:

This paper examines the industrial art of videogame design and production as an exemplar of what could be termed affective design. In doing so, the paper theorises the relationship between affect, and attention as part of what Bernard Stiegler calls a 'retentional economy' of human and technical memory. Through the examination of a range of different videogames, the paper argues that videogame designers utilize techniques of what I term 'affective amplification' that seek to modulate affect, which is central to the commercial success of these games. The paper considers how the concepts of amplification, modulation and bandwidth, developed through this example, inform and expand understandings of this retentional economy by analysing the ways in which affective design attempts to transmit and translate the potential for affect through a range of technical systems and environments.

keywords: affect, technology, attention, affective amplification, videogames.

1. Introduction

Recently Bernard Stiegler (2010a) has argued for a new critique of political economy based around an analysis of the retentional systems that structure the possibilities for the transference of human knowledge. These systems form what he terms a 'retentional economy' that underlies all contemporary experience. This retentional economy refers to the way memory is exteriorized into a series of objects in the environment (which Stiegler terms tertiary retentions) and how this memory operates to shape future action and experience. This paper theorises the relationship between affect and attention to discuss an emerging form of what could be termed 'affective design' that operates as a subset of this retentional economy. Affective design can be understood as the process of attempting to indirectly generate particular kinds of affects or responses through the material and aesthetic design of products in order to capture and hold users' attention. Recognising the open ended and contingent nature of these design processes, the paper generates a vocabulary for understanding how attention is dynamically captured and managed through the concepts of amplification, modulation and bandwidth. As Thrift argues, affective design has become particularly important within a range of different industries:

> [I]t has become clear that affectively binding consumers through their own passions and enthusiasms sells more goods. Consumption is itself a series of affective fields and more and more of the industry that investigates consumer wants and desires is given over to identifying possible emotional pressure points… Sensory design and marketing have become key (Hill 2003). (2006: 286-288).

As Berlant (2008) and Featherstone (2010) argue, capitalism has always been affective—consumer goods have always been designed to seduce and allure the senses in a number of ways. Indeed, Thrift draws upon a number of such examples. Car doors, for instance, 'are designed to give a satisfyingly solid clunk as they shut. New cars are given distinct smells. Breakfast cereals are designed to give a distinct crunch' (2006: 288). Jenkins terms this process of affective design for economic ends 'affective economics' (2003: 17).

The relationship between affect, attention and affective design opens onto consumer culture more broadly. As Shaviro argues "[d]igital technologies, together with neoliberal economic relations, have given birth to radically new ways of manufacturing and articulating lived experience" (2010: 2). Shaviro argues that the techniques utilised in contemporary film operate as "machines for generating affect, and for capitalizing upon and extracting value from, this affect. As such they are not ideological structures, as an older sort of Marxist criticism would have it. Rather, they lie at the very heart of social production, circulation and distribution" (ibid p3). In a similar mode, Beller suggests that attention is the "the newest source of value production under capitalism today" (2006: 4). For Beller, reality itself becomes organised around the production of a 'cinematic' form of attention: "The cinematic organization of attention yields a situation in which attention, in all forms imaginable and yet to be imagined…is that necessary cybernetic relation to the socius—the totality of the social" (Beller 2006: 4). Attention becomes both a finite, exchangeable commodity and a necessary relation that offers access to others in the world. As Goldhaber argues, this forms the basis of a whole economy of attention: "having attention is very, very desirable, in some ways infinitely so, since the larger the audience, the better. And, yet, attention is also difficult to achieve owing to its intrinsic scarcity. That combination makes it the potential driving force of a very intense economy" (Goldhaber

1997 no pagination). Put simply, the question of attention is important here because, as Stiegler argues, the capture of attention through a variety of ‘psychotechniques’ is central to the monetization of audiences through advertising, the development of brand loyalty and the blurring of boundaries between work and play in a variety of media (Yee, 2006; Venn et al, 2007; Stiegler, 2008: 38; Paul, 2010).

As I go on to outline, Stiegler argues attention is only possible through the existence of a series of retentions that make up the objects in an environment and, thus, form the content of perception itself. Processes of attention and retention are structurally linked by the types and qualities of objects that make up an environment. The paper develops the example of videogames in particular to show how affective design, utilised in the capture of attention, operates indirectly through a series of retentional ecologies and environments. Videogames are an interesting example of processes of affective design because every aspect of videogames are actively designed on a micro-level to generate particular forms of affect. As a designer for the hit videogame series Halo puts it:

“A lot of the energy weapons in Halo 2 felt frail, like pyoo-pyoo-pyoo Buck Rogers lasers [referring to the lasers used in the series of films] ” he says. It made people not want to pick them up and use them. "This feels more deadly. You can almost feel the heat of the weapon, the ignited plasma beams." He chuckles. "You know this thing is gonna kill”. (Doyle, cited in Thomson 2007).

The designer argues that the simple sound a weapon makes upon firing directly influences whether someone uses that weapon in the game or not. While this might seem to be a minor or unimportant point, these micro-levels of affective design add up to shape a user’s satisfaction with the game experience as a whole and, thus, directly contribute to

the game's commercial success or failure. The importance of this micro-level analysis is emphasised by the fact that there are now whole companies who can be hired to quantify the biological basis of user experience of videogames through testing, including measuring processes such as tracking eye movement of players in real time to analyse how they perceive and interpret visual information on screen (Heijden, 2010).

Videogames are a useful example because they allow us to theorize the relationship between affect and attention and, in doing so, to consider how a retentional economy of attention becomes technically constituted. Drawing on a variety of processes from different videogames, I argue that we can use videogames to understand the forefront of this kind of affective design by analysing how affect is amplified and modulated in practice via the technologies and techniques utilised in videogame design in order to produce, manage and hold players' attention. Developing such a language is important because as Thrift argues:

> [T]his lack of an ontological vocabulary is now becoming a practical as well as a theoretical issue. A new ontology is multiplying, which is able to survive by virtue of technologies which seem to lead to irresistible inferences about the world, because they, quite literally, put things in their place (2011: 23).

By developing the concepts of modulation, amplification and bandwidth, the paper offers some ways of theorising how these assemblages operate. Furthermore, the paper contributes to debates surrounding affect and materiality by arguing that, although the affects a particular technological system can produce can never be fully determined by its designers, these designers can produce systems that attempt to narrow the possibilities for the kinds of affective responses that are generated. Developing an account of how

processes of affective amplification and modulation in videogaming operate is an excellent way to begin to think through how affect is modulated via non-human means (also see Crogan and Kennedy 2009; Kinsley 2011). Videogames are an effective example of the autonomy of affective design because, as a commodity, they are designed to work in the tension between structured rules of the game code and the emergent gameplay of the user, which cannot be fully anticipated before the game is played (see Wardrip-Fruin, 2009; Whitson, 2010).

Before moving on it would also be pertinent to reflect on the fact that the games examined in the following sections have a largely male player base, which means that these processes of affective amplification are directly tied to the generation and reification of particular kinds of male subjectivity. For example, writers such as Halter (2006) argue that war games such as the Modern Warfare series operate to produce a popular culture in which war and conflict are acceptable and celebrated (also see Derien 2009; Hunteman and Payne 2010; Allen, 2011). While issues around the nature of war and war gaming are not directly addressed in the paper, the theorisation provided here will provide space for future in-depth discussions about the relationship between the technical processes of accumulation and competitiveness and the forms of subjectivity they enable.

The remainder of the paper forms four parts. In section two, I consider the relationships between affect, attention and retention and argue that human attention oscillates across a continuum and that affect is central to how attention shifts within this continuum. In section three, I explicitly theorise affective design through the concepts of modulation, amplification and bandwidth in order to show how affective design attempts to shape the ways in which attention shifts across this continuum of attention in videogames. In section four I gather together a myriad number of techniques utilized in different games under the

headings of ‘progression’ and ‘scripted events’. In doing so, I show how these techniques operate in different ways to modulate and amplify affect in order to encourage the user to invest time and energy into these games by limiting the continuum of players attention within a specific bandwidth. I close by pointing to sites of adaptation as players work with and around this process of affective design and how the concepts developed in the paper complicate and enrich Stiegler’s account of a retentional media economy.

2. Theorising the relationship between affect, attention and retention

In Taking care of youth and the generations, Stiegler argues that the capture and holding of attention is central to the ‘battle for intelligence’ (2010b: 17) that is currently being waged between the media industries and consumers. Steigler argues that consumers’ capacities for developing attention are breaking down in the face of media technologies that emphasise short attention spans. The resulting incapacity for attention has broader effects on the transmission of knowledge through society (2010b: 13). For Stiegler, the kind of attention produced by new media such as videogames should not be defined by the duration of attention given to an object but as a diffused and elliptical process that is constantly operating between two poles which he terms ‘vigilance, as the nervous system’s activity in aid of survival instinct, and what is called…floating listening [which refers to the capacity to generate new associations in thought while engaged in an activity through stimuli that are present in an environment]’ (2010b: 78). At the same time, Stiegler argues that a capacity for attention is technologically produced in the sense that the temporal flux of attention is structured by the technical environments in which humans find themselves.

[A]ttention is the flow of consciousness, which is temporal and, as such, is created initially

by…'primary' retentions - primary because they consist of apparent (present) objects whose shapes I retain as though they were themselves present. This retention...is then conditioned by secondary retentions, as the past of the attentive consciousness - as its 'experience'. Linking certain primary retentions with secondary retentions, consciousness projects protentions as anticipation. The constitution of attention results from accumulation of both primary and secondary retentions, and the projection of protentions as anticipation (2010b: 18).

In other words, attention is made possible by a relationship between present perception (primary retention) and past experience (secondary retention) both of which are enabled by the technical objects and knowledges that make up the environmental content of that past and present experience (tertiary retention).

Alongside its technical constitution, attention can be broadly conceived as a continuously shifting oscillation or what Lanham (2005) terms an 'oscillato' along a continuum between a number of different states. As Lanham suggests, these forms of focus are not discreet states, but continuously shift in relation to specific contexts, events and situations. To be more precise, attention in the first sense "is focused mental engagement on a particular item of information. Items come into our awareness, we attend to a particular item, and then we decide whether to act" (Davenport and Beck 2001: 21). In the second sense, attention is not an active or intentional process; it is a nonconscious background task that directs humans to matters of concern. As Massumi argues:

Attention is the perceptual automatism that consists in tagging a change in the perceptual field as new and potentially important and building awareness on that change, for the very

good reason that it may signal a necessity of a response or an opportunity for action (Massumi, 2010: np).

On top of this basic distinction between a focused and general attention, Davenport and Beck (2001) argue that attention can be further broken into two sets of paired opposites: aversive/attractive and captive/voluntary attention. On the one hand "[a]versive versus attractive has to do with carrot-and-stick motivation. We pay attention because we wish to avoid negative experiences, whereas we pay attention to other things because we think they may bring us positive experiences" (ibid: 23). Captive and voluntary forms of attention on the other hand "have to do with choice…You pay voluntary attention to things you find innately interesting, things you'd focus on even if doing them was explicitly forbidden. Captive attention…is thrust upon you" (ibid: 22-23). For Stiegler, humans are always already thrown into technical environments in which they find themselves in-between these poles. We may (attempt) to ignore the smell of rotting food by actively paying attention to a song or musical performance. At the same time, we may be stuck in a railway carriage with the rotting food and, thus, our attention is to some degree held captive to the smell. Alternatively, we may find ourselves in a park where one can simply walk away from the source of the smell. At any one moment attention is being continuously modulated by a series of conditions and factors, which emerge from mixtures of voluntary and involuntary, conscious and unconscious action. Understanding attention as operating on a modulating continuum between conscious and unconscious awareness as well two poles of paired opposites allows us to explicitly theorise the relationship between affect and attention.

In its broadest sense, affect refers to the capacity to affect and be affected by other beings, entities and processes (Deleuze 1988, Thrift 2004). Affect can be defined as the

force of an encounter. To be attentive in any sense is, therefore, to be affected by something: regardless of whether that affect is registered consciously or unconsciously, or has a small or large effect. Considered in this way, affect operates as the environmental backdrop that presents or pushes certain entities or events towards the bodies of those within that environment. Affect is often defined by its transpersonal and pre-individual quality (Venn, 2010). It is considered to be a property of the world, rather than of particular human beings (Clough, 2010: Manning, 2010). Most recently affect has been considered as an atmosphere:

An atmosphere is not an inert context but a force field in which people find themselves. It is not an effect of other forces but a lived affect or capacity to affect and to be affected that pushes a present into a composition, an expressivity, the sense of potentiality and event (Stewart, 2010: 8 see also Anderson, 2009: McCormack, 2008: Ruddick, 2010).

In this sense, affect can be understood as a ‘communicative contagion’ (Mitchell, 2010, Jones 2009): a touching together of various bodies which shapes the capacities of those bodies to act or respond to a situation. When we encounter rotting food, the power of the stench is precisely its capacity to affect the body. How we modulate our attention in relation to this issue is shaped by the possibilities and material affordances of the environment in which we are located. Understood as the force of an encounter, affect opens up and prompts attention to take place. Affective design attempts to modulate and amplify the relations between the various poles and pairs of attention described above. Specifically, it attempts to utilise the space between aversive and attractive and voluntary and captive forms of attention that operate across the full spectrum of attention as both conscious and focused, and unconscious and environmental.

3. Affective design: amplification, modulation, bandwidth

Stiegler argues that processes of attention construction are always specific to the media in question. The focus becomes, 'to identify various forms of attention according to the kinds of retentional and protentional flux brought about in…[media]…by… psychotechniques and psychotechnologies, each one of which is quite specific' (2010b: 83). In other words, one should investigate the perceptual states that videogames generate and the processes through which these states are produced.

Videogames are part of a particularly complex form of affective design because videogames operate as externalizations of designers' (apparent) intentions rationalized into code. They have what Bennett (2010) terms a 'thing power' insofar as they contain a dynamic which exceeds both the players' and designers' intentions; players' actions are not directly controlled by the designers, and designers can never be sure about how the game will be taken up and played by the public. As O'Donnell (2011) argues videogames operate as complex assemblages of human knowledge and skill that work indirectly through processes of programming and code which have been durably fixed and externalized into particular material forms, such as disks or information downloaded from the internet. In this sense, videogames (and the code through which they operate) can be rethought through Stiegler's deconstruction of the absolute distinction between living and dead matter. As Stiegler suggests:

Between the inorganic beings of the physical sciences and the organic beings of biology, there does indeed exist a third genre of 'being': 'inorganic organised being' or technical objects. These non organic, organisations of matter have their own dynamic when compared with that of either physical or biological beings, a dynamic moreover, that cannot be reduced to the aggregate or product of these beings (1998a: 18).

Technology can be understood as inorganic organized being, which is a form of being that is irreducible to either biological bodies or inert passive matter. Objects act as what Stiegler terms supplementary memory or 'tertiary retention' as apposed to primary retention (perception) and secondary retention (recollection) (see Stiegler, 1998b: 2008: chapter 4: Hansen, 2006). Tertiary retention is memory that has been externalized from human beings and inscribed into specific material forms that carry the potential for the transmission of knowledge and affect across time and space within them. Videogames, as coded software objects, form part of what Stiegler terms a broader 'technical history of memory' (2010a: 31) and, thus, a retentional economy.

Stiegler argues that this retentional economy operates through a process of grammatisation, which refers to 'the process through which the flows and continuities which weave our existences are discretised' (2010a: 31-32). For example, with the advent of writing, speech became translated from a temporal flow of sound into a series of discreet spatialised marks. In Stiegler's account, all forms of knowledge in human history are part of a process of grammatisation, and this grammatisation affects and rewires our entire embodied sensorium. As he explains: 'grammatisation is the history of the exteriorisation of memory in all its forms: nervous and cerebral memory, corporeal and muscular memory, biogenetic memory' (Stiegler, 2010a: 33). However, I argue that affect cannot be grammatised in any simple sense. Instead, systems of affective design work to

translate the *potential* for new affects to be experienced or memories of affective experience reactivated.

The relationship between affect and these systems of tertiary retention can be understood in two ways. Firstly tertiary retentions operate to encourage the development of particular forms of somatic or bodily memory. In videogames the generation of somatic memory operates in a feedback loop between body and game environment, producing particular affective attunements embodied through players "tendencies to react to categories of events" (Protevi, 2011: 402). For example videogames require particular somatic responses to situations if players are to complete prescribed actions and advance through them. These responses can range from knowing the appropriate button to press to being able to perform a complex combination move in specific temporal window. As Bryant argues, over time, somatic experiences can become "inscribed in the fiber of…[the]… nerves and muscles of…[the]…body" (2011: 277) and in doing so become retained for future experience. As I argue elsewhere these somatic memories are shaped by the particular properties of the game environments in question (Ash, 2012). Secondly these tertiary retentions work to translate and recontextualise this somatic memory into more explicit forms of conscious image recollection. Here the retentional systems of videogames operate to associate affective experience with visual icons such as achievements and points. As the paper discusses in section four this enables the spatialization of the somatic memory associated with an achievement or success into durable graphic form that can then be translated and transported elsewhere in order to generate value for the corporations that create and manage these systems.

As complex simulations, videogames are designed to produce a larger possibility space for the amplification of affect than many other commodities. By possibility space I mean

the potential for action embodied in a particular object and its relation to a broader environment or system. This can be clarified by returning to Thrift's (2006) affectively designed car door. The car door may only be one aspect of the broader assemblage of technology that makes up the car, but the sound it makes is predetermined by its small possibility space of physical movement. It opens and closes according to particular mechanical rules and makes a noise dependent on the properties of the materials from which it is constructed. The door's possibility space to produce and amplify affect is thereby limited by its material properties and the design function that also limits its capacity to move. Videogames, on the other hand, generate complex rule based systems that have a greater capacity for emergent action in the contingent space opened up between the player and rules of the game as they play (see Ash, 2010). With the concept of possibility space in mind we can now further develop the ideas of amplification, modulation and bandwidth.

In the usual sense, amplification generally refers to a process of increase or expansion—one amplifies ones voice to be heard at a distance, for example. In a technical, electrical sense, amplification refers to the change in the amplitude of a signal. Amplifiers usually operate by moving an input signal through a transfer function to create an output signal. In doing so, the input signal can be altered; the amplitude of the signal can be increased or decreased. As will become clear in section four, affective amplification is not an attempt to simply increase affect, but rather a matter of attempting to generate and modulate between affective states. For Depraz "'To modulate'means 'to vary,' 'to be inflected,' 'to adapt' to particular cases or contexts of meaning" (2004: 14). In this context modulation specifically means two things. Firstly it refers to using particular techniques to shift and alter affective states for example from a positive to a negative state. Secondly it refers to attempting to maintain a particular affective state for a period of time. For example

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maintaining a negative or positive state for a sustained period of time. The modulation of these affective states are intimately linked to the types of attention generated.

In videogame design, this is perhaps most apparent in games that utilise a death mechanic that forms the risk/reward basis of their gameplay. In the Playstation 3 game Uncharted, players die if they fail certain challenges, such as jumping between rock faces or shooting enemies. Dying is designed to produce negative affects in order to encourage players to increase their skill, which in turn generates positive affects such as success and accomplishment when they repeat and achieve a goal that they had previously failed. This basic structure operates to modulate the relationship between various forms of attention. In Uncharted, players have to pay aversive attention in order to avoid being killed (thereby avoiding negative affects) and at the same time have to pay attractive attention in order to attempt to kill other players (and generating positive affects). Videogame designers also attempt to draw upon voluntary attention (they want to create games that players want to engage with) while creating a form of captive, or captivating attention (they want to create games that players wants to continue to play) (see Ash, 2012). As an oscillating process that builds awareness—and thus partly shapes—future action, attention is a key capacity that can be activated, shaped and modulated by processes of affective design.

Affective manipulation in the large possibility space of videogames is further problematised when affect is recognized to exist outside of simple determinative relations of cause and effect which generally govern computational programming and game design. As Connolly argues, the effects of affect are best thought of as resonances rather than assured outcomes, whereby ‘causality…morphs into energized complexities of mutual imbrication and inter involvement, in which heretofore unconnected or loosely associated elements fold, bend, blend, emulsify, and dissolve into each other, forging a qualitative

assemblage resistant to classical models of explanation' (2005: 870). Designers have to work with the contingency of these resonances in order to minimize negative affects (Ash, 2010). Because they are constitutively open to indetermination, games cannot simply create or transmit affect; they modulate affect within a specific bandwidth.

In a technical sense, the concept of bandwidth is related to that of amplification and has two meanings. Firstly, bandwidth can refer to the amount of information that can be carried from one point to another in a specific amount of time. Secondly, bandwidth refers to a space of optimal frequencies in which signals give a satisfactory performance. I want to adapt this concept of bandwidth to refer to the modulation of affect in order to structure attention around a set of narrowly spaced retentions and protentions. The concept of bandwidth is useful precisely because it points to the precarious nature of attempting to modulate and amplify affect and indicates how success or failure of these modulations are often based on very small degrees of difference in how videogames play out or are structured. Too many variables and the player feels overwhelmed and out of control; too few and the user may become bored through lack of stimulation. Games studios invest enormous sums of money into creating games that operate within these narrow bandwidths, which they rely upon in order to create critically and commercially successful videogames.

However, this is not to say that such affects or modes of attention are universal. To be clear here, the processes of affective design may generate particular emotional responses to a situation, but the particular personalized content of these emotional responses only emerges in relation to the particular biographies, contexts and social position of those being affected. In other words, while affect may be 'prepersonal' in the way that it modulates attention, it is certainly not a-cultural or a-contextual (Protevi, 2009). With this

in mind, the next section examines the particular techniques of affective modulation and the forms of attention they attempt to generate.

4. Techniques of affective amplification

a) Progression

In videogames, progress is largely about creating a sense of development—a moving forward toward relatively known or unknown futures within the context of the game. Typical examples of progress in videogames revolve around leveling systems. Completing actions such as defeating enemies or obtaining equipment results in players receiving experience points. Upon reaching prerequisite thresholds of points, players ascend to the next level, often unlocking new equipment or abilities in the process (Ashton, 2011 and on game reward systems more generally Jakobsson and Sotamaa 2011). This process of progression through the quantification of experience has a long history in videogames, stretching back to early arcade machines which kept high scores that were displayed on high score tables while the game was not being played (Juul, 2004,)

Increasingly in current videogame design, this quantification is becoming linked in real time to the visceral experience of both success and failure within the game. This linking is actively used in order to amplify feelings of success and minimize emotions such as disappointment and frustration. An example of the development and increasing sophistication of these processes can be seen in the continuities and differences between First Person Shooting (FPS) videogame Call of Duty 4: Modern Warfare and its sequel Modern Warfare 2. The Modern Warfare series in particular is a useful example because both games employ processes of affective amplification with a great deal of success,

which is reflected in the games' massive commercial success. Until the release of the series sequel Call of Duty: Black Ops (2010) Modern Warfare 2 was the best selling game of all time in the UK and second best selling game of all time in the US with over twenty million copies sold worldwide (Sinclair 2010).

The multiplayer component of Call of Duty 4 introduced a new way of displaying the accumulation of experience points to players. Every time a user kills another enemy a mustard yellow coloured '+50' or '+100' notice appears as an overlay in the middle of their screen just above the barrel of the their weapon. The colour has been carefully chosen in order to avoid clashing with any of the environments in which the game is played, which means that the notice is always prominently displayed against the background of the image. In this way, Call of Duty 4 successfully associates the visceral success of killing an enemy with a broader quantitative progression of the players' character as they level up over time. Indeed, when reaching a new level while playing, a short stylized electric guitar riff plays and the title of the user's new level is briefly displayed on the screen. The affective resonance of sound and number adds to amplify and reinforce affect as it (potentially) becomes personalized into the emotion of success.

With the development of Modern Warfare 2, the designers Infinity Ward introduced a system of 'death streaks' to make the game more accessible to new players and, thus, maximise their potential audience. Death streaks operate in the opposite way to the celebrated 'kill streak' perks of the first game (after three consecutive kills players could launch a spy plane to reveal the location of enemies, for example). Once a user reaches a particular threshold of consecutive deaths, they unlock one of a series of increasingly powerful perks, which activate as they respawn into the level. These death streaks include 'Pain Killer', which gives players a big boost in health for ten seconds, and 'Matrydom',

which causes players to drop a live grenade the next time they are killed. Players who are killed three or four times in a row might be feeling incredibly frustrated and ready to turn the game off. However, if the next time they respawn the Pain Killer perk gives them an advantage that allows them to kill an enemy, they may be drawn back into the game. The specific mechanics of the game attempt to manage and mitigate a sense of failure in an explicit attempt to keep players playing the game.

In doing so the game mechanics attempt to shape and control affective amplification within the gameplay experience. The death streaks in Modern Warfare 2 are designed to reduce the amplification of affect associated with failure in the user as they continue to die within the game. The console and game act as an amplifier to reduce the amplitude of the user's upset and annoyance as much as to increase the amplitude of emotions such as success and progression. In this way, amplifying affect is as much about generating differences between input and output signals as it is about increasing an input signal. In the display of points in Call of Duty 4, affective amplification works to differentiate between and draw upon a variety of sensory signals such as colour (the mustard yellow colour of the '+5' sign on screen) and sound (the electric guitar riffed played upon leveling up) in order to work and stimulate the senses into recognizing these signals as 'separate' (they work on different sensory levels) but connected to one another (together they signify the user has progressed through the game). This, in turn, creates and amplifies the potential emotions of success.

Such examples also point to the ways in which these techniques attempt to generate particular bandwidths to limit and manage players' affective and attentive response to situations. The death streaks could be understood as attempting to limit the duration of negative affects the player experiences, while the kill streaks attempt to prolong positive

affects the player experiences. In this example these two limits operate to create an ‘optimal bandwidth’, an ideal space in-between the two affective extremes where a player can continue to play without feeling excessive frustration on the one hand or indifference on the other. It is within this bandwidth that attention is captured most effectively within videogames.

Contemporary videogames also work to take these achievements and markers of progress and translate them outside of the immediate context of winning into broader networks that allow comparison and contrast with other players. The development of Achievement Points systems provides a concrete example of how the potential for affect is translated into a tertiary retention and transported between particular contexts and events and, in doing so, become potentially amplified. Both the Xbox 360 and Playstation 3 (two of the main competitors in the current videogame console marketplace) have their own systems of ‘achievements’ and ‘trophies’. Every game developed for each console has to have these unlockable awards programmed into them. Microsoft decrees that each Xbox 360 game must have 1000 unlockable achievement points. These are usually split into a number of achievements which, depending on their difficulty, award a percentage of the total amount of points. On the game Alan Wake, the ‘Carny’ achievement earns players 10 achievement points for knocking over all the five-can pyramids which are scattered around the game environment, whereas the ‘Alan, Wake Up’ achievement earns the user 50 points once they have completed the game on the ‘Nightmare’ difficulty mode. Unlocking an achievement during gameplay on an Xbox 360 game results in a ‘blip’ sound effect and a small standardized rectangle appearing on the top right of the screen with the name of the achievement and the amount of points it provides. The ‘blip’ sound effect draws the player’s attention to the graphical rectangle and its presence at the moment of achievement generates an association between the affective experience of achievement

and the graphical icon. In this case the somatic memory associated with finding five cans or completing a level on the hardest difficulty setting is translated into a more explicit visual image.

These achievement points have absolutely no exchange value in themselves, either in terms of the game in which they are achieved or a broader reward system within the Xbox 'Live' network on which these games are played. Yet, many players avidly pursue points across multiple games because of their affective value. This is demonstrated by the existence of websites such as www.achievementhunters.com, which operate purely through the documentation of how to obtain various achievements within games. In this case the achievement points have an affective value in two senses. Firstly the achievements points allow a public display of skill and serve as a tertiary retention that enables future reactivation of a memory regarding a particular affective encounter. Looking through ones list of achievements on your Xbox live user profile one can think back to the difficulty and satisfaction of completing Alan Wake on nightmare difficulty for example.

Secondly gamerscore points have an affective value in the sense that they can be combined and recombined in a number of ways to produce the potential for new affects to emerge. Some gamers regularly discuss which games it is easiest to obtain achievements in, even when these games are very poorly rated by the professional games press. Games like Hannah Montana: The Movie—which received a dismal score of 25 out of 100 on the review accumulation site metacritic.com—was awarded 'Easy Xbox 360 achievements.com game of the year 2009' (Dooney 2010). On various videogame forums, Hannah Montana is often heralded as a game that people will play simply to earn points, rather than for an enjoyable or interesting gameplay experience. For many players playing

Hannah Montana itself produces little positive affect; but using the achievement points collected to bolster the players overall gamerscore does produce positive affects. The desire for accumulating a large gamerscore is evident in the emergence of third party websites such as mygamercard.net, which allow players to create a dynamic image of a card displaying their username, reputation level, current gamerscore, and a list of their most recently played games. This card can be used in internet forum signatures and on blogs. The site boasts of over three and a half million users and suggests:

What makes MyGamerCard.net so useful is that it truly makes your GamerCard portable…once you convert it and add it to a web page, it will automatically update as your information does. What's more, is that every time your…GamerCard is viewed, your statistics will be updated on our GamerScore Leaderboard so you can see how you compare in the gaming community (gamercard.net, 2010).

Mygamercard.net adds a further metagame to the Xbox Live achievement system, which is a metagame in itself. Through the mygamercard.net website, users can compare their gamerscore to other users and try and get the highest score on the service (for example, at the time of writing a user known as Stallion83 was number one on the leaderboard with a gamerscore of 490675). The translatable and portable nature of the gamerscore and tag enable a proliferation of services that allow the almost endless comparison and ranking of various scores and, thus, the further translation of potential affect into various contexts, systems and competitions. Thinking about these achievements as technics, with an autonomous dynamic of there own, allows us to recognise how this autonomy is actively utilised and amplified by videogame companies in order to generate value. A single achievement score could be judged on the number of games the user has played, the display of any rare achievements (achievements that are incredibly difficult to obtain),

the total number of games in which all the achievements are obtained, and so on. Indeed the existence of websites such as gamercard.net point to the ways in which third parties can draw upon and utilize this data for profit. In this case an achievement viewed through the gamercard.net website produces the potential for affect in a number of ways. On the one hand the achievement may serve to reactivate previous memory of an affect associated with gaining the original achievement. At the same time, as part of a larger overall score, the achievement also produces a new positive affect in the sense of gaining a high rank on the mygamercard.net leaderboard.

As Stiegler argues “all retentions convert time into space” (2010a: 66). In this case the achievement icon, the display of achievements on users’ profiles and the mygamercard.net website work to spatialise the temporal flux of sensori-motor skill which enabled the achievements to be gained. Through the process of spatialization the achievement icon, achievement score and services such as mygamercard,net translates the somatic memory of sensory skill into a visual marker that quantifies and names that experience. The total amount of points, and a list of achievements that have been earned by a user across multiple games is displayed on their user profile and can be viewed by friends and other players. As such this process of spatialization creates a durable marker that allows a player to reflect upon, and share their experience through a more explicit form of reflection and recollection. In turn this allows a further transportation and potential amplification of affect. To be clear affect itself is not translated or transported through these systems. Instead these systems transport the potential for the reactivation of memories regarding an affective encounter or the potential production of new affects through encounters between players and new combinations of data. In either case the potential for affect is amplified beyond the original event in which the achievement was gained.

b) Scripted Events

Perhaps the most interesting development in processes of affective amplification are the ways in which contingency is simulated in a variety of single player action and adventure games through the use of ‘scripted events’. As the name implies, scripted events refers to moments when the player moves past a certain point or area. In doing so, they activate a pre-scripted dramatic moment to occur. In many of these moments, the player is still in control of their character but is forced down an increasingly narrow pathway or towards a specific objective. These scripted events are often sudden catastrophes that serve to alter the pace, objective and environment of the game. These scripted events can be theorized through Berlant’s concept of the ‘situation’. For Berlant ‘[a] situation is a state of things in which something that will perhaps matter is unfolding amidst the usual activity of life’ (2008: 5). In the case of videogames, these unfoldings are often abrupt and fundamentally matter to the player through shaping their potential for movement and action.

For example, the Modern Warfare 2 level ‘Second Sun’ begins with the player trapped in a crashed helicopter with little ammunition and an ensuing enemy force. The scene is depicted as hopeless, and draws upon expectations from the previous game where various player characters the user controls die throughout the game. Just as the enemies appear to be overwhelming the player, a nuclear weapon detonates in the surrounding area. This releases an electro magnetic pulse (EMP) which knocks out all electronic devices within the environment in which the user is playing. The player has to race through the streets until they reach safety as objects—including planes and helicopters falling from the sky—smash around them.

As a scripted event, the EMP in Modern Warfare 2 is particularly effective because it is a 'global' event—it fundamentally changes everything about the environment in which the user finds themselves. After the EMP, all the street lights go out and the electric sights and optics on the player's weapon are dead. With no street lighting, the only lighting sources come from the flames of burning and crashed vehicles which completely alters the mood and feel of the environment. Like the majority of scripted events in single player action and adventure games, the EMP in Modern Warfare 2 is designed to introduce peril—a sense that nothing is quite what it seems and that anything could happen. As such, these kinds of videogames attempt to create a sense of constant anticipation and expectation in the user.

It would be easy to paint scripted events within videogames as utterly effective: unexpected and shocking. However, players quickly learn to anticipate scripted events as they experience a variety of different games. At the same time, they cannot fully anticipate the content of these events and the creative responses these events may require of them. These processes of anticipation and expectation are centrally implicated in producing a specific mode of attention. In Stiegler's terms, scripted events attempt to amplify the user's capacity for both protention and retention through a close wedding of primary and secondary retentions (perception and memory) which are needed to project (anticipate) future events. Indeed, following Stiegler, one could argue that the proliferation of scripted events in games draws players attention into a space in between aversive and attractive and voluntary and captive attention. Players become attractively and voluntarily attentive in order to avoid negative affects, such as dying, which in turn produces an intense state of captivated attention. In other words, scripted events encourage the player to concentrate on the present moment but, in order to do so, they must constantly shift

between a state of perception (primary retention) and memory (secondary retention) that enables anticipation (protention) to occur.

By further examining the EMP event in Modern Warfare 2, we can reflect on how the game is structured to enable this distribution of perception and thus produce a particular affective bandwidth, which at the same time constructs an attentive body. In the opening of the crash site scene, there are a large number of enemies who are hiding amongst rubble and debris, which is hard to identify against the dark sky in the background. The flames generated by the helicopter crash also obscure the user's vision. In this moment, players strain to identify the enemies and their attention is shifted to the background. Calls from computer controlled teammates close by draw their attention back to the foreground. These calls disclose a narrative in which all members of the team are running out of ammunition. A teammate throws the player the last' magazine. This draws their attention even closer to the foreground, as they camera zooms in to watch the player's character reload the weapon. With the ability to fire again, their attention can be focused on the distant enemies, and so on. This specific example highlights what could be argued to be a trend in the structure and development of scripted events within action and shooting games. This type of event is structured in order to distribute attention by developing spatial and temporal juxtapositions between here and there, near and far, past and future.

This distribution of attention into the game environment seems to require that players pay closer attention to what is going on. In other words, when players' attention is distributed among a greater number of variables,, those players have to work harder to keep up with what is going on and, thus, pay greater attention to the game itself.

Many games designers place scripted events throughout the levels players move through in a specific order so that these events are designed to be experienced at various temporal intervals to further amplify the chains of retention and protentions of players perception. These intervals act to create a tempo and rhythm that attempts to modulate the affects that players may experience when exposed to them. Affects become most pronounced when juxtaposed with one another, and the amplification of affect can usefully be heightened through a process of juxtaposition which generates the capacity for players to sense difference between particular affective states. In Modern Warfare 2, moments of pronounced slowness are often followed by periods of intense speed. During the EMP event everything moves in slow motion as enemies approach the helicopter within which the player's avatar is trapped and then speeds up again once the EMP has hit and planes are falling out of the sky. These processes of juxtaposition serve to generate and amplify affect within an optimal bandwidth; a space between over stimulation on the one hand and boredom on the other. While the potential for affect is latent in any situation the specific content of the game actively shapes the potential for these affective states to become interpreted as particular emotions. Amplification, in the sense developed here, is always about the modulation of the potential for affect.

5. Conclusion

In this paper, I have outlined a series of processes through which affect is amplified in videogames and unpacked how these processes operate as a psychotechnique for the capturing of attention. For Stiegler industrial hypomnesic apparatuses such as videogames are part of a "vast process of cognitive and affective proletarianization – and a vast process of the loss of knowledge(s): savoir-faire [knowledge of how to make or do], savior-vivre [knowledge of how to live], theoretical knowledge, in the absence of which all

savor is lost" (2010a: 30). In turn Stiegler argues attention is reduced to a series of retentional systems and in doing so becomes "standardised…particularisable, meaning… formalisable, calculable and finally controllable'" (2010b: 99). Rather than resulting in the loss of knowledge the paper has pointed to the ways in which attention capture techniques have become more dynamic and complex in new media technologies and actively draw upon and utilize skill and knowledge in order to effectively capture attention. Shaviro (2010) argues that new media produces, rather than simply represents, the world and ways of living in it. In this case the 'structures of feeling' (Shaviro 2010) generated by the games I have examined cannot be understood as standardized or calculable in any simple sense.

Games companies attempt to control and manage affect and the potential emotional states produced by this affect within a particularly narrow bandwidth of possibility. This has lead to a situation in which attention is now of such great value, from both the players' and designers' perspective, that developers can successfully monetize user experience when they are unwilling to 'pay attention' and play parts of their game. The, ironically named, 'Time is Money' downloadable content for the Xbox 360 skateboarding game Skate 2 allows players to pay to unlock all the in-game items and equipment, a feat which is usually achieved (for 'free') by completing challenges in Skate 2's single player mode (Gibson, 2009).

However, the success of the techniques of affective modulation in videogame design and experience are far from assured, and the consequences of failure can be severe. A single unsuccessful game can be enough for a studio to find itself bankrupt. The massively multiplayer online (MMO) shooting game APB cost $100 million dollars to develop, but closed down after only three months of operation because players left the game

complaining of outdated play mechanics and issues with the ways weapons were unlocked within the game (Brown, 2010). Processes of affective modulation have very narrow margins for error. The bandwidth in which affect can be successfully modulated to generate attention is always a slim one and difficult for designers to tune into.

Just as these bandwidths are themselves narrow and difficult to generate, players always find ways to modify, respond and adapt to the games they play that exceed and even confound designers' expectations and desires (Consalvo, 2007). The above discussion of the EMP event in Modern Warfare 2 assumes that all players 'correctly' follow the scripted action, but this is not always the case. Players may get lost or stuck. On repeated play throughs, they might try to intentionally respond to these events in the way the designers did not intend. Nonetheless, players will eventually (if sometimes begrudgingly) submit to the will of the designers and follow the scripted event if they want to progress through the game.

The concepts of modulation, amplification and bandwidth developed here allow an alternative reading of the retentional economy that Stiegler (2010a; 2010b) suggests is central to contemporary experience. Indeed, these concepts complicate any idea of a simple transmission of affect between individuals, systems and objects. Rather than a discreet digital process in which affect is grammatised and translated between different contexts, affect remains fundamentally analogue, open and autonomous. The success of the systems and techniques discussed above accrues from their ability to harness and potentially reactivate the memory of existing affective encounters, and/or translate these memories into the potential generation of new affects. Continuing to investigate and unpack the relationship between attention and the generation of affective value requires that we recognise the fundamentally analogue nature of these processes. It is only then

that we can begin to understand the broader implications of this retentional economy in relations to other objects, systems and environments.

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1. While many surveys point to videogaming as an activity enjoyed by males and females in increasingly equal numbers, there are fundamental differences in the games that males and females play and the type of hardware they play them on (although of course there are also differences within gender, see Lazzaro 2008, Thornham 2011). As Kafai et al (2008) suggest, videogame consoles and console games such as Call of Duty are still largely played by men (a report from the NPD group (2009) puts the percentage of female console players in the US at 28 percent in 2009 for example).