Playing It Cool?

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Abstract:	Whilst Marshall McLuhan is often acknowledged as an influential theorist for Game Studies, there is very little work currently available that directly attempts to apply McLuhan's theoretical framework and terminology. This article therefore provides an overview, interrogation and application of McLuhan's taxonomy of Hot and Cool media to digital games. McLuhan describes Hot media as 'high fidelity' and 'low participation', whilst Cool media are conversely 'high participation' and 'low fidelity'. The article summarises McLuhan's conceptual spectrum, and articulates how these qualities can exist not only within digital games, but also within the player: their skills, competencies and literacies. In doing so we propose the further quality of 'pattern' to better describe how Hot and Cool features operate within game experiences. The article finally discusses how Hot and Cool game designs can impact user's affective, cognitive, motoric and socio-cultural responses to the play experience.

Playing It Cool?: Considering McLuhan's Hot and Cool Taxonomy for Game Studies

Then, in a small town in Italy, the first mechanical clock was built. People were spellbound. Later they were horrified. Here was a human invention that quantified the passage of time, that laid ruler and compass to the span of desire, that measured out exactly the moments of a life. It was magical, it was unbearable, it was outside natural law. Yet the clock could not be ignored. It would have to be worshipped.

(Lightman, 2012: 102)

Plodding through what is assumed to be Quantico, the Federal Bureau of Investigation's (FBI) training headquarters, I have a lot of time. My sensorial involvement with the gamespace is, as with most First-Person Shooters (FPSs), oriented towards mechanoreception: my eyes scan the walls, picture frames, and doors rapidly; not for something to *see* but for something to *attack*. Literate in FPS convention, I expect a staccato of resistance: one enemy after another in discrete temporal sequence.

After seconds of searching, no enemies appear. The delicate rhythm of my avatar's walk has a decided effect upon my own bodily sense of pressure and movement: I notice - strangely for an FPS - that I am sitting back, relaxed in my chair as I play. I anxiously search for the approved pattern of interaction with this gameworld. Does this door open? No. Is this picture on the wall important? Perhaps, it allows selection and rotation. Ah! I can pick up my character's lipstick and apply it. '*But to what end?'* my being-in-the-gameworld ponders, habituated through the experience of innumerable First-Person Shooters (FPSs).

Traditionally, FPSs are a very 'Hot'[1] design, to use Marshall McLuhan's terminology (1973). Which is to say, they are 'high fidelity' (1973: 31), providing strong definitions for

[1] Throughout this article, to aid reader comprehension, 'Hot' and 'Cool' will be capitalised when deploying McLuhan's concepts.

what to do (kill), how to do it (shoot), and why one should do so (bad things threaten the avatar's existence), woven in a tight temporal cycle. FPSs are also 'low participation' (1973: 31), with action limited to shoot, move, shoot, move. In addition, FPSs tend to be, in terms of level design, linear, congruent with McLuhan's articulation of 'high definition', a Hot feature (1973: 31); the player is tasked to move from 'A' to conquer 'B', then 'B' to conquer 'C', and so the process repeats. The movement procedure itself changes our relationship with time, particularly the interplay of duration and impatience; in a conventional FPS, one never waits, but instead acts (shoot, move, shoot, move). The affective response such design provokes is markedly dissimilar to the arrival of enemies in a sandbox game. For example, the immediate arrival of threats within an FPS is often experienced as relief, since it signifies the opportunity for progress through the game. Comparatively, within a sandbox game such as *Minecraft*, alarm is instead felt at the unexpected incursion into one's play space.

Overall, we might say the FPS genre offers a concordant pattern for the user: the design conveys, as explicitly as possible, what the player is to understand and do, and in the Hottest designs it is simply the user's part to obey and execute instructions. Concurrently, the more efficiently the player performs, the Hotter the experience.

Curiously, though an FPS, *Virginia*, the digital game described in the opening paragraph, is a very 'Cool' design. In the game, the player takes the role of an FBI agent investigating the disappearance of a child. The user's capacity to investigate is contoured by two forms of interaction, both standard within the FPS genre. Firstly, the player controls movement through the environment, yet this control is constantly challenged by disjunctive transportation across locales. At one moment the player is searching the missing child's bedroom, before a dissolve fade suddenly occurs and the player is observing the view from the passenger seat of a car as a buffalo stumbles into the road.

Secondly within *Virginia*, the player aims the cursor at the centre of the first-person view, pointing and clicking. Yet this clicking is not to *shoot*, as the FPS acronym suggests, but instead to *touch*, fumbling with mundane objects such as rubbish bins, cupboards and feathers, much more like a 'point and click' adventure. Due to such deviation from the FPS formula, *Virginia* (and games like it) have recently been designated as a sub-genre of the FPS, known, rather pejoratively, as Walking Simulators (WS).

Such design evident in Walking Simulators works to 'Cool down' the Hot FPS genre, in McLuhan's terms (1973). Which is to say, contrary to the typical Hot features of an FPS, the Walking Simulator is 'low definition' (Why am I here? What are the rules? How do I win?) and 'high participation' (1973): I am searching every nook and cranny of each space and attempting interaction with *everything* as I try to work out the mystery of the game rules. Though as sequential as a typical FPS, it does not explicitly delineate where 'A' or 'B' are, shifts between them without explanation, and provides no feedback on the win/lose conditions for this perambulation. Overall, the design provides a rather discordant pattern for the user: after completion, one may remain unsure whether the narration was reliable, whether they played the game 'correctly', whether the game is winnable at all. Indeed the Walking Simulator genre's lack of fidelity, e.g. absence of explicit instruction, evaluative feedback, concise narrative, characters serving as obvious heroes and villains, is highlighted as one of the main reasons it's 'gaming's most detested genre' (Clark, 2017: online).

As hinted, of particular interest are the affective, motoric and cognitive impacts of *Virginia*, in relation to the standard FPS. Phenomenologically, FPSs tend to have a very Hot relation to the eye, fingers, and interoceptive system, due mainly to the time pressure imposed by the 'shooter' dynamic native to the genre: locate target, aim, fire, repeat. This 'one-thing-at-a-timeness' (McLuhan, 1973), characteristic of a Hot medium, is reassuring in its clarity and tempo. Yet as mentioned *Virginia*, and other Walking Simulators (hereafter

WSs) like *Gone Home* and *Firewatch*, Cool this experience considerably; the 'one-thing-at-a-time' heat of the FPS becomes an 'all-at-once' Coolness (McLuhan, 1973) experienced as a fumbled, slow foraging around the gameworld of *Virginia*.

As Väliaho articulates, the standard FPS is 'visuomotor: in them, eye merges with hand, vision with gesture . . . The contents of perception are something we enact when probing the world with our sensorimotor capacities and skills' (2014: 121). In an FPS, the eye *targets*; in a WS, the eye *searches*. In an FPS, the fingers *tense* on the trigger in anticipation of action; in a WS, the fingers *slide* lackadaisically across the face buttons in exploration. In an FPS, the body is rigid and poised; in a WS, it is relaxed and placid. Moreover, the WS becomes a waiting game. Where the standard FPS has a mechanical clock that adds or imposes order to the game, often through the intervallic appearance of enemies or the time-pressure imposed by an objective, the WS turns off time-pressure, almost entirely. This instantiates the difference between having things appear (at hand) versus a sense of urgency to find things: the terror caused by the abstract uniformity of the clock, whether in speed run or in time-sensitive mechanics, is dissimilar to the anxiety felt at not knowing how to interact at all. Depending upon its design, platform, and control scheme, a game can have markedly different impacts upon one's cognitive, affective and motoric intentionalities.

The goal of this article is to explore the utility of McLuhan's concepts of Hot and Cool when applied to the digital game, and whether it allows scholars to explore new avenues of thinking about the medium. This is appropriate as McLuhan is perhaps best viewed not as a media theorist (or ecologist), but as a metaphysician of media. In other words, instead of focusing his work upon an individual medium, McLuhan articulated the ontological and epistemological qualities of mediation itself, before relating these to individual media.

If McLuhan's articulation of Hot and Cool is valid, then there are substantial ramifications: from this perspective, a medium's impact upon our emotion, cognition, and

social engagement all vary based upon its relative Heat or Coolness. Before applying McLuhan's Hot and Cool duality to games however, we should situate the spectrum within McLuhan's larger project.

1.1 Media as Ex-Tension

McLuhan's best-known work, *Understanding Media: The Extensions of Man* (1973), proposes that all media (more broadly conceived as technologies) are a reaching out of humanity's embodied capacities: wheels extend the legs, walls the skin, language the intellect and social capacity, electricity the entire nervous system. One of McLuhan's foundational assumptions is limitation: the sensorial apparatus can only process so much, and therefore equilibrium must be maintained through selective focus on one sense (or senses) at the expense of others. Extension, therefore, creates a new sense ratio in the person and society, as the sensorium reconfigures to accommodate new media. Every extension, or medium, creates a key limitation, which McLuhan calls an 'autoamputation' (1973); a limiting effect on perception in order to avoid the amplification of or the intensity wrought by the change of scale, pace and pattern—that is, the message—of the medium. Simply put, autoamputation occurs when systemic overload is threatened. For example, as one participates in their mobile phone call, other senses dim to compensate for the intense focus upon the conversation; a friend walks by and says hello, but the phone user has a delayed reaction due to this overload of inputs, taking a second or two before recognition occurs, apologetically responding, 'sorry, I'm on the phone!'.

As *ratio* implies, this also impacts one's model of rationality and broader capacity for understanding. For example, McLuhan (1973) views Western civilisation as ocular—indeed scopophilic—since the uptake of the alphabet. The alphabet and its attendant ocularity emphasises linearity, abstraction, and deduction, which led to the development of science,

monotheism, and individualism as defining traits. Readers may note in this regard McLuhan once more finds correspondence with phenomenological perspectives, from Heidegger's critique of Cartesian metaphysics (2008) to Foucault's discussion of discipline and surveillance (1995), to Jonathan Crary's historical analysis of the observer (1992). All emphasise the increasing centrality of the eye to Western civilisation as initiating new modes of being, social organisation, and aesthetic appreciation.

The specific use of the word 'extension' by McLuhan is no accident, as he holds that all media act as prostheses of sorts to outsource a strain (*ex-tension*). As with a literal prosthetic, this is a transformative process that also has a numbing effect intended to maintain sensorial equilibrium: as one sense takes prominence, others recede. Through repeated use of a particular technology (and thus sense), one becomes numb, unaware of and unreflective regarding the medium's contouring of one's being-in-the-world, and also insensitive to its broader impact upon society and culture.

In very material terms, Ouellette (2013) shows how the smartphone requires an autoamputation of the hand and by extension exteroceptive perception—as in minding a toddler while minding a phone—of the beholder. Moreover, Bolter and Grusin (1999) extend McLuhan to argue that the mediation effects of 'new media' tend toward what they call 'immediacy' (1999: 6). This refers to the medium's attempt to erase evidence of its own mediation in the transmission of content, i.e. borrowing established stylistic conventions from other mediums to appear 'natural' or 'transparent' for the user. Thus, when making a telephone call, we often say 'I'm talking to [a person]' because of the sense of immediacy, rather than 'I am speaking on a telephone'. What follows is generally the autoamputation described above, as one becomes figuratively and sometimes literally blind to mediation and its numerous effects.

To return to the example of the phone call, it is no surprise, then, that selfies have been banned from certain locations and some jurisdictions have had to ban texting while crossing a street. Similarly, the game controller, which limits responses, reactions and reflexivity, short circuits our broader perceptual apparatus; focusing one's engagement with an environment through a very specific routine of actions. The importance lies not only in the perception itself but also in the mediation's allowance for the user to reflect on it. As Merleau-Ponty (1968) writes:

> [T]he functioning of reflection, like the functioning of the exploring body, makes use of powers obscure to me, spans the cycle of duration that separates the brute perception from the reflective examination, and during this time maintains the permanence of the perceived and the permanence of the perception under the gaze of the mind only because my mental inspection and my attitudes of mind prolong the "I can" of my sensorial and corporeal exploration. (38)

This article's opening quote, where Lightman (2012) describes the (fictional) effects of a clock upon a village population, is helpful in grasping a vivid understanding of McLuhan's theory. The introduction of the clock was conterminously an initiation of new modes of existence, as time became an exact, measurable, and above all abstract resource, detached from its environment. Along with other supporting technologies, this enabled the standardisation of a working week; the 9-to-5 calculation of productivity ('time is money'); worries around 'wasting time,' and so on (Thompson, 1967). The clock's effect upon the sensorial apparatus was enormous, as it meant the eye now took further prominence: time had become something everyone could measure with the totalitarian exactitude of the gaze. In Heideggerian thought, technology like this initiates a public mood of anxiety, also

translatable as panic and terror. As Lightman insightfully points out (2012: 102), the defence mechanism against overwhelming anxiety can evidence as transmutation into a kind of opposite: terror becomes worship. Where terror is general, worship (like panic) has a terrifying specificity.

For Merleau-Ponty (1968), time is 'familiar to each, but none of us can explain it to others' (3). It is no mistake, then, that McLuhan's frequently misunderstood aphorism 'the medium is the message' refers to pattern as much as scale and pace. The clock changes the relationship not only to the scale and pace of work and labour, but to its pattern. This is the very contingency of the FPS vs WS debate within game culture. In the FPS, the player is a labourer; in a WS, the player is a worker. The former amplifies simple patterns and loops of play, where the latter, in its lack of fidelity and demands on participation, reminds one that they *configure* a game as much as they *play*. In either case, the cognitive and affective response is an indexical one, particularly as a measure of the balance between work and labour and of the changes in their scale, pace, and pattern. Bearing in mind these phenomenological parameters for McLuhan's understanding of technology—as centred upon experience and the human sensorium, as prosthetic which massages, extends and numbs—we now provide an outline of Hot and Cool as originally defined by McLuhan.

1.2 Hot and Cool v1.0

McLuhan defines a Hot medium as 'one that extends one single sense in 'high definition.' High definition is the state of being well filled with data…Hot media do not leave so much to be filled in or completed by the audience. Hot media are, therefore, low in participation' (1973: 31). As mentioned McLuhan's diagnosis of Western civilisation is scopophilia, neurotically visual, which is to say he understands Western civilisation as fundamentally Hot before the advent of electricity. The eye is a very Hot sense, perhaps the

archetypal 'high definition' technology: 120 degrees of high fidelity perception extended through glass, light and LCDs, requiring relatively little participation for comprehension, relative to other senses. The eye is also a very individual technology, i.e. what one sees, *one* sees: there is no possibility for someone else to see the exact same phenomenon from the exact same perspective without the deployment of further technologies such as cameras. Western fixation upon the eye has led to the linearity, rigidity, and emphasis on rationality, uniformity, exemplified in technologies such as the printing press, the clock, and calculator.[2] In media, this is further extended to concepts such as the gaze (of the cinema), the glance (of the television), and now the glaze of the digital game (Chesher, 2007).

Cool media are 'low definition,' requiring multi-sensorial involvement as 'so little is given and so much has to be filled in' by a user, hence 'cool media are high in participation or completion by the audience' (1973: 31). If the eye is Hot, then the ear is Cool: 360 degrees of varying fidelity which at times requires intense focus for unintelligible 'noise' to become intelligible 'sounds'. Unlike the eye, when one hears, others may hear equally: versus the individuality of sight, the ear is a communal technology.

This is of course not a binary situation, i.e. utterly one sense or another, but rather a systemic change. When we speak of the eye or ear as dominant, we are indicating which sense is most prominent in that engagement, but it is always a systemic transformation. Within *Understanding Media* (1973), McLuhan provides a few examples: the telephone is Cool and the radio is Hot; a lecture is Hot and a seminar is Cool; jazz is Cool and the waltz is Hot; Richard Nixon was Hot and John F. Kennedy was Cool.

For explanatory purposes, perhaps the clearest of McLuhan's illustrations is the telephone versus radio, their effect upon the ear and how this modifies one's sensorial

[2] McLuhan (1973: 136) cites Mumford who speculates with a considerable degree of plausibility that the clock precedes the printing press as the principal device that influences mechanization of Western society.

system. To be more concrete, let us consider the Coolness of a telephone job interview versus the Heat of a pop song on the radio. The telephone medium requires high participation and offers scant information: questions are fielded with a few parameters, carefully attended to by the interviewee, along with the questioner's rhythm, intonation, and, crucially, silences. Indeed, moments of visual, aural, temporal, spatial, or ludic silence are key indications of Coolness in any medium.

The interviewee must, of course, respond at a certain point, and this is one of the most important tasks confronting the user of any Cool medium: pattern heuristics. The user must develop a few rules of thumb to locate the medium's optimal pattern. In this instance, the interviewee, through careful attention, must apply rules to interpret, firstly, the 'correct' moment of response, and then how to fill in the response with the 'correct' content.

The radio pop song massages the senses in an altogether different manner. Firstly, silence, a characteristic of Coolness, is very rare in commercial radio. The Heat of the radio is evidenced in its constant filling of the ear with information: pop songs often build upon one or two leitmotifs structured in a simple verse-chorus-verse or verse-chorus-bridge pattern. As fulfilling the criteria of high fidelity/low participation, the song requests of the listener an attribute key to all Hot media: rather than pattern heuristics, pattern recognition. Opposing experimentation with different models of interpretation, i.e. pattern heuristics, the simplicity of the pattern encourages (sometimes various kinds of) recognition.

Thus, part of any Hot media strategy is to bombard the user with a few simple patterns. Indeed, as John Fiske might add (1989), the pop song *as* popular *must* bombard, i.e., overwhelm with recognition, to generate polysemy, presenting for the user a certain breadth of meaning for identification. If successful, the pop song's meaning becomes a rhizome for each listener to follow as suits their needs. One need not understand the lyrics to South Korean pop artist Psy's *Gangnam Style* for enjoyment; once one recognises the song's simple

patterns, including paratexts such as the music video choreography, comprehension can follow for adult, child, Korean native and non-speaker. This is often the limit for participation within traditional Hot media, as Aarseth touched upon through his concept of ergodicity, or quite literally the 'work path' of the game or digital text (1997); one must work, not just mentally but physically, to pick a path in certain artefacts. Yet, this extranoematic reconfiguration allowed by games and play (Aarseth, 1997) can vary in terms of how it Heats up or Cools down an engagement, as we will discuss. Before that, however, we should explain the phenomenological orientation of this article regarding its deployment of Hot and Cool.

1.3 The Sensorial Ratio

The human sensorium is defined by its dynamism (see for example Heidegger, 2008; Huron, 2006; Sheehan, 2015). It reconfigures, automatically across contexts, in pursuit of an optimal gestalt for comprehension and action. As one gains experience in a scenario, the more rapid and discerning the sensorial response becomes, the more possibilities identified, the quicker they are acted upon, the better the performance. Simply put, player skill and literacy is a Heating up of any engagement. As Dreyfus describes, 'what the learner acquires through experience is not *represented* in the mind at all but is *presented* to the learner as a more and more finely discriminated situation, which then solicits a more refined response' (2002: 373, emphasis added). Further:

> [A]cting is experienced as a steady flow of skilful activity in response to one's sense of the situation. Part of that experience is a sense that when one's situation deviates from some optimal body-environment relationship, one's activity takes one closer to that optimum and thereby relieves the "tension" of the deviation. (2002: 378)

In this article's introduction, one's cutaneous mechanoreceptive system, which regulates (amongst other things) one's mechanical and tactile sensitivity (Johnson, 2001), is prominent in one's sense of being-in-the-gameworld. The more one plays FPSs, the more acute this sensitivity, the quicker this discernment of the situation and response. As mentioned earlier, the FPS and the WS afford different experiences of time. In McLuhan's words, we 'chafe under the uniformity of clock-time [. . .] we seek multiplicity, rather than repeatability, or rhythms' (1973: 138). Where the FPS speeds up play through the multiplied urgency of saturation, the WS is the absence of time pressure. It is no mistake then that Cool genres, such as simulators like *Farming Simulator 17*, have options to accelerate or compress time, wherein hours become seconds, days become minutes; games like *Skyrim*, which could be described as a Walking Simulator with boss fights, includes a fast travel option.[3] Such Cool designs hand control of time over to the player, allowing high fidelity, time sensitive encounters, just in case the player desires a burst of Heat within a Cool gamespace.

Though Farrow and Iacovides (2014) are correct to highlight the many ontological and phenomenological limitations of digital embodiment, the crosshair *as* eye, the gentle bob of the character's movement, are in a limited and ambiguous manner connected to one's corporeality. In response other senses, such as the interoceptive system (sense of appetite, heartbeat, breathing, need for the toilet, and so on), fade into the background to maintain sensorial equilibrium. In other words, digital embodiment is not only *limitation*, it is also *extension*, as one's sensorial ratio adapts to the phenomenological *tension* of the situation. As one's literacy with the various symbolic orders and technologies evolves, new possibilities

[3] As a corollary, it is intriguing to note that model railroaders who choose to simulate operations frequently use a 'fast clock' to assist in producing realism because the physical scale change of a model is insufficient.

for being-in-the-world emerge (Gualeni, 2014). With this phenomenological approach outlined, we now turn the Hot and Cool spectrum to digital games.

2.0 Hot & Cool v2.0

We should first note that games are *ipso facto* a heating up of social reality, adding high definition to any situation: ambiguous social relation becomes player or non-player, friend or enemy; ambiguous temporal-spatial relations become demarcated both materially and ideally, to paraphrase Huizinga; subjective, limited understanding of success and failure in everyday life becomes objectively signified through concrete win and lose scenarios.

Using Caillois' terminology (2001), if the structured *ludus* mode of play described above is a Heating up, then its opposite, the open, improvisational *paidia*, is a Cooling down of any game situation. Paidia—pure play, utterly improvisational, without set limits and win/lose conditions—takes away the definition and explicit pattern of engagement that ludus otherwise provides, offering greater participation across ontological levels. In paidia, one is not only player but often at the same time also occurrent designer. This is most obvious in a game like *Minecraft*, but also part of the underlying basis of the *Grand Theft Auto* series. Therefore, a foundational complementarity for Hot and Cool is found in ludus and paidia, respectively. Tied to this, as mentioned, is the understanding that player literacy is always a Heating up, as proficiency adds fidelity and pattern to the engagement.

Though the medium, genre, platform and interface set the initial boundaries for one's sensorial engagement, a game's design can sometimes materially evidence dialogue between developers and their player communities. When too much Coolness presides, users may develop Hot responses like speed runs or enabling cheats such as 'god mode'. Designers may respond by introducing meta-game rewards such as scoreboards and medal systems for such activities; even a car racing game like *Forza Horizon 4* incorporates mini-games, tasks, and

achievable achievements to mask the work of driving from point-to-point around the map.[4] This 'law of reversal' (McLuhan, 1973) will be further discussed in section 3.2.

As noted, in translating McLuhan's explicit criteria for Hot and Cool into gamic terms, a conceptual metaphor of 'pattern' emerges, which better ties into the bodily and affective dimensions of Hot and Cool. 'High definition,' the extension and filling out of one or few senses by a medium, is explicit in digital games. Video games tend to emphasise the eye and the hands, adroitly subsuming other senses in its service: in FPSs, the eye directs the hand; in racing and music games the eye composes the mechanoreceptive response, as one leans in, jumps back, hops up and so on.

The higher the definition, the more emphatically one sense is targeted. Pattern recognition games such as the 'Match 3' genre are very Hot in targeting the eye-finger relation, especially when played on mobile platforms in public areas where sound is diminished.[5] It should be noted here that a common strategy to extend the difficulty curve of many games is to introduce Cooler features, and the Match 3 genre is an excellent example: as one becomes more competent in the game and risks 'overheating', the design Cools the player by adding hidden bonuses, combinations and extra elements, demanding the user switch from pattern recognition to heuristics.

Cooler designs, as low fidelity, demand the user spread attention using not one or two senses but a sensorial system. Strategy games, such as the 4X sub-genre,[6] do indeed demand the user's eye and hand, but these are subsumed under complex cognitive tasks such as

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[4]Indeed, it could be argued that the correspondence between Hot and Cool offers an opportunity to consider the indexical dimensions of affective intentionality.

[5] Match 3 games are named as such since they require the user to match three entities of a particular quality (e.g. colour, symbol, shape). See, for example, *Candy Crush Saga*. One could argue that *Tetris* is the digital archetype for these games, though pattern recognition games have a much longer analogue history: Noughts and Crosses, for example, goes back to the Ancient Egyptians.

[6] 4X games are named after the four core dynamics of games in the genre: eXpand, eXplore, eXploit, eXterminate.

information organisation, activity monitoring, abstract assessment, and scheduling (Paas and Van Merriënboer, 1994). Point-and-click adventure games (e.g., *Thimbleweed Park*), puzzle games (e.g., *The Witness*), and role-playing games (e.g., *Undertale*) similarly require the deployment of complex cognitive tasks. 'Tower Defense'[7] games recall the classic *Pipe Dreams*, but add time compression, strategy, resource management, and other elements that Cool down the genre, allaying the Heat contributed by a skilled player.

As McLuhan articulates, the higher fidelity, the lower the participation (and vice versa). Therefore, in high fidelity games the participation is simple, occurring across one or two dimensions such as moving and firing a weapon in an FPS, jumping between levels and collecting items in a platformer game, or selecting matching patterns in the Match 3 genre. What makes such tasks difficult is generally time pressure, which is often manifest as a points system (lap time, score, experience points, achievements) and/or the presence of threats in the environment (enemies, traps, obstacles). Where the scheduling of a 4X game *anticipates* time, the need to plan ahead in a Match 3 *times* anticipation; that is, in Hot designs, success is often an index of *anticipatory* rather than *participatory* perception. Low fidelity games are high participation as they require the user to move across various dimensions of interaction and domains of understanding to *fill in* the game, as McLuhan might say, and therefore are less aggressive in terms of time pressure.[8] More simply, Hot design employs time pressure to target motoric intentionality, whilst Cool design employs multiplicity (of systems, information, and attention) to target cognitive intentionality, and each of these have markedly different effects upon one's bodily and affective response, and further, interactions between players and communities.

[7] A subgenre of strategy game where the objective is to place defensive structures (such as towers) within the gameworld to obstruct and resist attackers.

[8] Although we recognize the potential for a gendering and/or a gendered reading of these functions this is beyond the scope of the current paper. We will, however, return to this topic in a forthcoming work.

2.1 Pattern

As suggested, the concept of *pattern* is helpful for comprehending the differences listed: as temporal, spatial, audio-visual, narratological and ludic phenomenon. Intimately tied to pattern are 'play loops' (Kietzmann, 2011), temporally-delineated cycles of engagement a user repeats across the game event.[9] Games, as McLuhan anticipated, demand repeatability both in design and in play. Loops emerge through 'skill atoms' (Deterding, 2015), understood as bundles of separate particles, which are identified as 'goals, actions and objects, rules, feedback, emergent challenge, and motivation' (313). As Deterding outlines, an atom 'consists of smaller reoccurring particles yet cannot be broken into these without losing its systemic 'gaminess.' A skill atom describes a feedback loop between user and system that is organized around a central challenge or skill' (2015: 313). In a Hot design such as *Halo 3*, for example, the most fundamental loop occurs approximately every three seconds (Kietzmann, 2011) as a player moves, shoots, throws a grenade, or engages in melee. On a thirty second loop, the player is completing a larger strategic goal, such as clearing a space of enemies, capturing an area, moving towards an objective, and so forth. Within a three minute loop, the player is completing a game objective: capturing the flag, defeating the boss, escaping the horde.

Hot designs tend to offer succinct play loops which are essentially *concordant*: the musical and etymological facets of this word are appropriate, as harmonious (musical), and as of the heart (etymological), i.e. focused upon bodily rhythms. Cool designs are likely to provide protracted play loops (for example 30 seconds/3 minutes/30 minutes) which are altogether *discordant*: as lacking harmonic integration (musical), and as apart from bodily

[9] A term which entered game design and criticism via Bungie's Jaime Griesemer (Kietzmann, 2011).

rhythm (etymological). Rather than explicitly targeting motor skills and bodily rhythm, in Cool designs the user is tasked with forging a sense of concordance through the cognitive skills described earlier.

3.0 Key Features – Heating Up

High fidelity is the essence of Hot design, targeting short-lived emotional responses such as excitement and fear; promoting rapid execution of motor skills; and enforcing a strict temporal pattern of engagement. This can manifest in hardware and software design as clarity, concision, and spectacle, oftentimes all three. Classic arcade games typically evidence these features in abundance. Consider classic arcade racing game *Out Run* for example. The narrative and ludic systems emphasise clarity: drive the Ferrari Tesstarossa Spider as quickly as possible; avoid obstacles; beat the timer. This trickles down to concise play loops: the player is avoiding obstacles every few seconds, and every few minutes completes a track. Such a pattern forms the essence of *Missile Command*'s infamous dilemma. Once the player decides (or discovers) that the key is to save missile bases instead of cities, the game proceeds as a concise play loop. The dilemma effectively disappears as the pattern emerges through player literacy. This is all interwoven with audiovisual, haptic, and mimetic spectacle that reinforces clarity. For example, the 1980's arcade version of *Out Run* is Heated up by spectacular mimesis: the player would literally sit within a cabinet stylised as the Ferrari Tesstarossa Spider controlled within the game, the skeuomorphic interface composed of a steering wheel, gear stick, acceleration, and brake pedals.

Therefore to Heat an artefact up, a designer has many strategies available. Clarity can be increased not only through expensive hardware interfaces, but also through the implementation of explicit goals, time constraints, and guidelines. A popular example is the twin design of 'breadcrumbing' and 'funnelling'. The former provides a trail for the player to

follow, in the shape of a literal line, highlighted landmarks, or dialogue delivered by NPCs (‘take a left!’/’go here!’). Meanwhile ‘funnelling’ puts the player back on track, sometimes literally, if they deviate from the breadcrumb. In a racing game this is evidenced in a track’s route and boundaries; the sudden relocation of the player’s vehicle to the track when they veer too far away from the course is a very Hot application of funnelling.

Concision can be increased through the compression of time, such as accelerating the ‘play loops’ (Kietzmann, 2011) described in section 2.1, so that a 1 minute/5 minute/10minute play loop becomes 30 seconds/1 minute/5 minutes. One can also reduce the amount of skill atoms (Deterding, 2015) within the game or automate certain atoms identified as Cooling the experience down. For example the Fighting Game *Divekick* Heats up the genre by restricting the user to the two eponymous interactions, ‘diving’ and ‘kicking’. We should also note this design is simultaneously a parody of the common tactic within Fighting Games to resort to repetitive diving and kicking; parody is always a Hot strategy as it emphasises clarity through amplification. *Portal*’s in-built meme, ‘The cake is a lie,’ stands as an archetype of this strategy in games.

Many games Heat up through automating processes such as resource collection, inventory management and avatar movement, central skill atoms left to player operation in Cooler genres. For example, following convention in action-adventure game design, *Spider-Man* allows the user to activate ‘parkour’ mode through the compression of a gamepad trigger, allowing the titular character to automatically jump over, slide under, and run across environmental obstacles without additional input. This also heightens spectacle, another key component of Hot design. Running across Manhattan’s rooftops, swinging over traffic, and leaping across buildings at enormous speed by holding the PlayStation R2 trigger, provides a visual and kinaesthetic extravaganza only deliverable through semi-automated fluidity.

3.1 Key Features – Cooling Down

Low fidelity is the essence of Cool design. In opposition to Hot design, this targets more prolonged emotional responses, perhaps better articulated as mood, such as fascination and anxiety, rather than emotions such as excitement and fear; it promotes cognitive skills around strategizing and task management; and finally it loosens the pattern of engagement, requiring the users develop their own rhythm of interaction. Overall in Cool designs, features are much more likely to be abstract in their representation, opaque in their processes, and unpredictable in their patterning.

To Cool a design down, the producer can lower fidelity. This reduction can firstly pertain to the audio or visual system, making sound and sight a more involved, interpretive process. Scott McCloud's germinal *Understanding Comics: The Invisible Art* (1993) is illustrative here, where he outlines a spectrum between the Hot 'reception' of a photographed face, versus the Cool 'perception' of words describing a face (see Fig. 1). McCloud explicitly acknowledges McLuhan's definition of Cool relating to comics (1993: 59), articulating how 'Icons demand our participation to make them work' (1993: 59). In many instances, as McCloud notes (1993), this Cool design also allows the user to project themselves into the character, rather than seeing the character as separate due to its Hot, high definition as an Other.

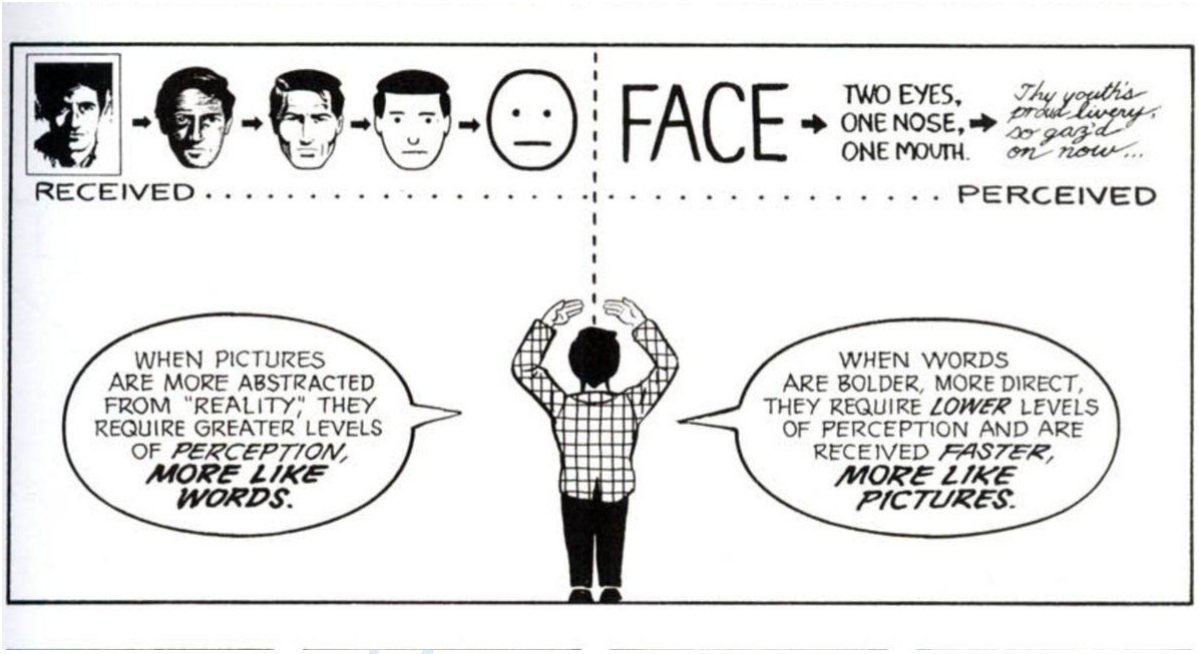

Figure 1 - McCloud (1993: 49)

Secondly, the designer can Cool the hardware and software interfaces. A game such as *Johann Sebastian Joust* Cools down the multiplayer 'death match' mode where all players compete to be the last one standing. Whilst the model of interaction is clear in First-Person Shooters (FPSs), where you simply shoot other players to win (much like laser tag), *Johann Sebastian Joust*'s (*JSJ*) knockout mechanic instead pivots upon Johann Sebastian Bach's *Brandenburg Concertos*. Avoiding graphics entirely, in *JSJ* each player holds a motion-sensitive controller and is 'knocked out' if they exceed the controller's tolerance for movement as set by the game. This tolerance is however not made clear, instead vaguely implied by the speed at which the concerto plays. As one would expect, this often leads to players anxiously circling one another as slowly as possible, fearing the slightest jarring movement will disqualify them from the game, all the while attempting to eliminate their opponents. As the music accelerates, so too does the anxiety each player feels, at the mercy of an opaque interface and feedback loop.

Finally, the designer can focus upon the game mechanics, including implementation of artificial intelligence, and how the user is evaluated and provided with feedback on their

performance. Management games such as the *Football Manager* series are an obvious example of Cool design where the underlying mechanics, their relative importance and consequences, are hidden from the user, who can only make guesses based on inference. Within the series the user is tasked with manipulating various parameters regarding a soccer team, from training regime to wages, recruitment strategies, fan relations, tactics and team talks. At some point the player enacts *and* witnesses all three parts—author, reader, and subject—of the rhetorical triangle. Yet the importance of each parameter, and its impact upon the team's success, is never rendered explicit.

This sometimes leads to users questioning, critiquing and debating such design, so much so that the developers often respond in acknowledgment. For example Sports Interactive employee Neil Brock responded in one forum thread questioning whether the series' core mechanics were broken, 'They're not broken, but some might say it's ambiguous as to whether changes you've instigated have made the difference', then describing the indirect control the user-as-manager has over the virtual footballers, 'If they do something they want to do (like hit a shot from 30-yards when you've asked them to shoot less) and it works, is that because of you or in spite of you?' (Brock, 2016: online).

Here, it is intriguing to note the hatred of the Walking Simulator (WS) in light of responses to other notably Cool designs. For example, Bethesda Softwork's *Elder Scrolls,* Bioware's *Mass Effect* games, and Hideo Kojima's *Metal Gear* universe, represent series requiring significant expenditures of time and effort between moments of action, demanding the user manually collect resources, manage inventory and navigate space. However, they include noteworthy Hot elements displacing the Cooling effects, such as cinematic cutscenes, parodic characters, and tightly-patterned minigames. Perhaps no other series displaces an otherwise Cool design more successfully than the *Grand Theft Auto* games. For example *GTA: San Andreas* is loaded with elements—bicycle riding, dating, the gyms—that might

seem Cool at first glance. The difference is that the *GTA* series adds high fidelity to such phenomena, and therefore lowers the capacity for participation. The games explicitly limit and evaluate the expenditures so tasks become routinized play loops: One must get food, slow down, or stop exercising in a predictable, temporally concise pattern to achieve particular outcomes.

3.2. Overheating and Freezing

Following McLuhan's law of reversal (1973), we should finally note how too much Heat or Coolness generates, phenomenologically, a systemic inversion of the experience, wherein Hot becomes Cool, or Cool becomes Hot. As we have noted, the Heat or Coolness of being-in-the-gameworld is a confluence of the game's hardware and software features, context, and player skills and literacies. Whilst a game design can be very Cool, extreme player proficiency can Heat this up through imposing a concise pattern of engagement and a clear understanding of diffuse goals and mechanics; a very Hot game can appear quite Cool if the player is extremely inexperienced, so that the otherwise clear dynamics and simple interfaces seem opaque.

If a game event has too much fidelity, and therefore affords too little participation, too little autonomy to the user, too strict a patterning, this can push Hot excitement into anger, before Cool apathy settles in. We need only look at the inclusion of features such as 'In-App Purchases' (IAP), allowing players to purchase hyper-ludic features (Conway, 2010), i.e. phenomena providing extreme agency within the gamespace: 'power-ups' such as overpowered characters, weapons or armour, a bounty of rare resources for avatar empowerment or building construction, or even the ability to automatically complete a level otherwise requiring user skill to overcome.

For example the extremely popular mobile game *Angry Birds* is a puzzle game revolving around the physics-based destruction of structures controlled by groups of pigs, via the firing of a slingshot. As levels progress, the physics-based puzzles can become extremely complex. To obviate such difficulty, the 'Mighty Eagle' can be purchased for 99 cents. This IAP allows the user to tap an icon at the top of the screen, initiating a sequence where an eagle swoops down, automatically obliterating the pigs and their structures. The user can in this manner bypass the entire level. Indeed this is in itself a good example of the law of reversal involved in ludicity: the hyper-ludic element is so powerful it effectively automates the playing of the game, removing user agency outside the single tap of a button. The feature is therefore better described as *hypo*-ludic (Conway, 2012), i.e. removing play, rather than enhancing it. The 'Mighty Eagle' feature Heats up the game's definition and pattern so completely it removes participation entirely, and this is the moment where Overheating might invert into an affective Freezing; apathy is suddenly felt as challenge is removed and the game plays itself.

Yet we should point out that the medium here, the modern smartphone, is Cool: an entirely touch-sensitive surface, wholly accessible for the software developer's configuration. Indeed with later iterations, such as the *iPhone 8* onwards, the measuring of touch pressure became possible too, a further Cool development. Added to this, mobile games are often played on trains, in cafes, waiting for a bus. In such Cool environments the mobile game becomes a source of much desired Heat, a burst of clear agency and empowerment. Features such as the Mighty Eagle are much more acceptable in such contexts. If introduced within Hot environments, such as the console or Personal Computer (PC), often situated in a living room or bedroom where a player can spend hours focused upon a game without distraction, IAPs are frequently too Hot, shortcircuiting the player's expectations regarding time expenditure and work. For example the introduction of IAPs into *Starwars: Battlefront 2*, a

multiplayer action game for consoles and PCs, was disastrous for the publisher, Electronic Arts (EA). The ability to 'pay to win' (Lawler, 2017: online), whilst accepted in the mobile game environment, infuriated console and PC players, leading the company to remove IAPs entirely from the product. As outlined, this Overheating had a predictable affective trajectory: firstly the playerbase reacted in anger (Lawler, 2017), before the burst of Heat reversed to a Freezing over; players adopted an apathetic response to the game, simply refusing purchase. Indeed the company's Chief Financial Officer directly blamed the IAP feature for a lack in sales in a report to the Wall Street Journal (Sarkar, 2018).

If we consider how too much Coolness can generate into extreme Heat, the phenomenon of 'cult' media present interesting examples. *Deadly Premonition* is a game with a famously impenetrable, scattered narrative, allied to a set of diffuse game dynamics (such as fishing, shooting, driving, investigating, dressing, eating and drinking); it draws upon various influences, such as cult television show *Twin Peaks*, whilst juxtaposing and interrogating the player-avatar relationship (Novitz, 2018). On top of this, *Deadly Premonition*'s interface is notoriously poor: the player controls, camera system, and game mechanics were frequently cited as poorly articulated or indeed unfinished at the time of release (Novitz, 2018). As expected, this Coolness resulted in frequent reports of puzzlement, a lack of interest, and sometimes derision from critics. Yet such extreme Coolness can generate fascination, as players attempt to provide the Heat of fidelity through intense participation, meticulously deciphering the narrative, comprehending and describing mechanics. In other words, the Coolness of the game demanded the player apply their own Heat, in the form of extensive work towards a comprehensive literacy. Such Heat sometimes transformed into cult worship, as certain players invested hundreds of hours into writing in-depth guides, publishing videos bringing together the narrative into a cohesive whole, and lauding the game as an unheralded masterpiece.

4.0. Conclusion

In this article we have considered whether Marshall McLuhan's spectrum of Hot and Cool is of utility to the study of digital games. We have found that, given a foundation in phenomenology, the concepts of Hot and Cool have much to offer in describing and understanding the experience of a game's design; how particular features can have a variety of affective, cognitive and cultural impacts, depending upon their Heat or Coolness.

One of our primary insights described concerns the interplay between the economy of time and effort in gameplay, and its impact upon the affective dimensions of the experience. The design of macro features such as user interface (hardware and software), narrative and character systems, camera perspective and game dynamics, single and multiplayer (cooperative or competitive) options, scoring systems, and so on, can all accelerate a phenomenological Heating up or Cooling down, leading to anger, shock, and excitement if the former, or fascination, apathy, and anxiety in the latter.

The gestalt temporal pattern of engagement such features inculcate, from the Heat of tense three-second firefights in multiplayer FPSs, to the Cooling of loose 30 minute play loops in single player 4X RTSs, have decisive impacts that filtrate game culture: not only the player relation to the game, but player to player relations, player to spectator, player to community, player to developer, player to hardware and more, as we have touched upon. The anger and vitriol so well-documented within, for example, the fighting game community (FGC) (Skolnik & Conway, 2017), is perhaps endemic to the Heat of the genre's design; within a Hot game environment, the autoamputation leads towards oral engagement to dispel the Heat overwhelming one or two senses. It is perhaps no coincidence that other, Cooler genres, such as the thriving genre of Space Flight Simulators, remain utterly absent in

scholarly discussion of contentious game communities (for an extensive history, see for example Kocurek (2015)) since, in the play of Cool games, players tend towards silence.

The medium's impact upon players' emotion, cognition, and social engagement, then, proceeds from the Hot and Cool features of a game's hardware, software, and social environment. Moreover, the cognitive and affective responses become indexes not only of Hot and Cool, but simultaneously of the balance between Hot motoric labour, and Cool cognitive work in any given game. As such, this calls into question the game design mantra that successful games are necessarily fun experiences, and that fun experiences will necessarily be successful games. Hot features in the wrong environment, targeting the wrong playerbase can irritate, frustrate, or even reverse into a Cool apathy; Cool features in the wrong context, for the wrong player, may generate anxiety, befuddlement, or reverse into Hot anger. By applying McLuhan's taxonomy, both designers and scholars can think through how fidelity and participation functions through specific game features and dynamics, from hardware and audio-visual systems to narrative, play mechanics, and interface design. In doing so, McLuhan's principles can be used to articulate and understand the embodied play experience.

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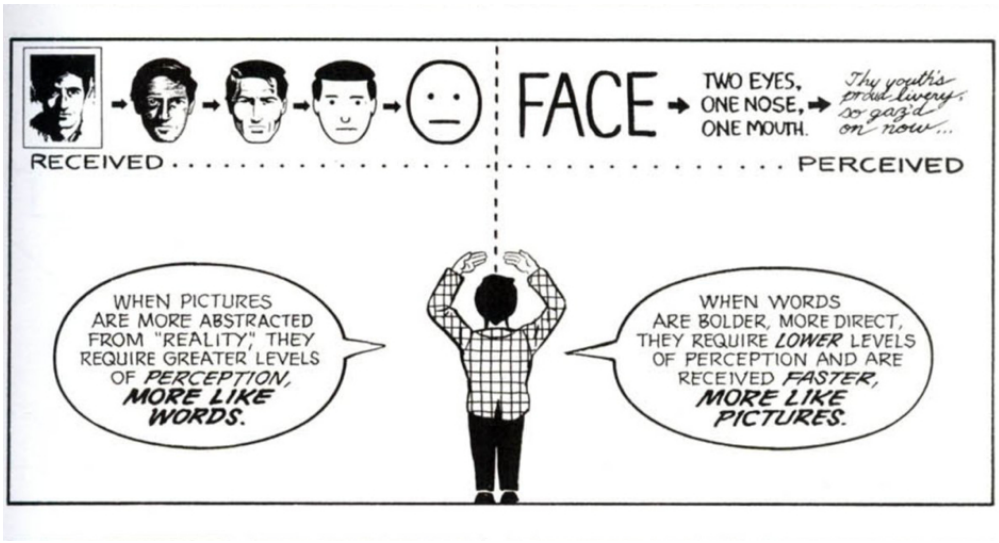

Figure 1 - McCloud (1993: 49)