Neural narratives and natives:

Cognitive attention schema theory and empathy in *Avatar*

by Paul R Hills

submitted in accordance with the requirements for the degree of

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DECLARATION

I, Paul R Hills declare that this thesis, **Neural narratives and natives: Cognitive attention schema theory and empathy in *Avatar***, is my own unaided work, except to the extent explicitly acknowledged. All the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

This thesis is being submitted for the Master of Arts (Art History), Faculty of Human Sciences, University of South Africa. It has not been submitted before for any degree or examination by any other university.

Paul R Hills

January 2020

ABSTRACT

This study offers a fine-grained analysis of James Cameron's film, *Avatar* (2009), on several theoretical fronts to provide a view of the film from a cognitive cultural studies perspective. The insights gained from cognitive theory are used to situate the debate by indicating the value cognitive theories have in cultural criticism. The critical discourse analysis of *Avatar* that results is a vehicle for the central concern of this study, which is to understand the diverse, often contradictory, meaning-making exhibited by *Avatar* audiences. A focus on the construction of empathic responses to the film's messages investigates the success of this polysemy.

The central propositions of the study are that meanings and interpretations of the experience of viewing *Avatar* are made discursively; they are situated in definable traditions, mores and values; and this meaning-making takes place in a cognitive framework which allows for the technical reproduction and reception of the experience while providing powerful, emerging and cognitively plausible narratives. In an attempt to situate the film's commercial success and its plethora of awards, including an Oscar for best art direction, the analysis takes a critical view of Cameron's use of cultural stereotypes and the framing of the exotic other, and considers the continuing development of these elements over the whole series and product line or, as Henry Jenkins (2007) defines it, "transmedia". In drawing the theoretical boundaries of the methodologies used in this study and in arguing for their complementarities, the study contributes to a renewal of Raymond Williams' (1961) mostly forgotten claim of the cross-disciplinary cognitive dimension of cultural studies and demonstrates an affirmation of this formulation as cognitive cultural studies.

KEYWORDS: cognitive – cultural studies, theory of mind, empathy, polysemy, film analysis, *Avatar*, James Cameron

DEDICATION

For my family, who help me understand.

ACKNOWLEDGEMENTS

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Clip 1: White mercenaries prepare for Na'vi attack

When James Cameron's *Avatar* premiered on US screens on December 16, 2009, I made sure I was there to see it. The Arlington, Virginia, 3D iMAX cinema complex is a stone's throw from the Pentagon and it was Marine day out for soldiers stationed at nearby bases. The long, dark passageway out of the theatre only half-prepared me for the foyer, filled as it was with Marines dressed identically to their actor counterparts in the movie showing inside.

Suddenly, a young Marine walking out with me exploded in outrage, his eyes searching for something, finding mine, "It ain't like that, you never find the white guys like that in the battlefield man, it's us who be in the front line, fuck this shit!"

I nodded empathically and passed on, having my own sense of dissonance from watching the film; his had caused an outburst and mine led me to delve deeper into my own oppositional readings to try to unpack all its elements and to one day find myself completing this study.

As I left the complex, the sky was bright American blue and I filed away a mental image of the young man's nametag, Cpl. Hall, ironically, stitched like history on his chest.

CHAPTER 1: INTRODUCTION

"From the idea that the self is not given to us, I think that there is only practical consequence, we have to create ourselves as a work of art" (Michel Foucault, 1961).

1.1 Background

There is a level on which James Cameron's 2009 film is genuinely exciting and it reflects the film's overarching premise, reflected by its title, *Avatar*, that consciousness could be shifted from one neural system to another. This seemingly far-fetched science fictional element is, in fact, the film's greatest strength reflecting very real, mostly recent research in human cognition and its deeper philosophical implications. Recent data produced by cognitive science, mostly led by researchers active in medical pathology, have infused new life into classical philosophy on the nature of subjective human experience, the mind and age-old nature/nurture binaries.

Media-savvy and popularly accessible scientists have built bridges between the arts and the physical sciences which have made this modest study possible. For example, Ramachandran's (1993, 1998, 1999, 2002, 2003, 2004, 2011) groundbreaking discoveries into phantom limb pain have contributed complex ideas, such as body schemas, embodiment and neural plasticity, to both new science and emerging cognately plausible art that find expression in cultural artefacts like *Avatar*.

These advances give substance to post-modern understandings that fluidity and uncertainty in meaning-making and values lead to an ambiguous freedom, resulting in what is referred to by Michel Foucault as an opportunity "to create ourselves as a work of art" (1983: 237). At the same time, it does not necessarily follow that fluidity in meaning-making (in the production and consumption of artistic/cultural artefacts) implies the absence of artistic universals,

framed only by cultural historicism. Given that this research takes place in an academic study of art history, these discussions impact directly on the quest for artistic universals (Ramachandran & Hirstein, 1999) and on understandings of individual artists' responsibilities. It may be that this reference to greater yet still not fully-understood cognitive choices and processes piques (some of) *Avatar* audiences' interests on an unconscious level while the conscious experience of the storyline and its visual effects rolls out in 3D and surround-sound.

This study is concerned with the incongruencies in meaning-making across *Avatar* audiences and researches the tensions between dominant, emergent and residual ideologies (Williams, 1961; Hall, 1983) in the construction of the film's messaging since, as much as there is audience appreciation of *Avatar*, there is also an opposing sense of dissonance – the ideological character of which ranges vastly, from popular sources which characterise the film as a leftist attack on American society (Shone, 2010), through those who herald its apparently progressive analysis of power and economic corruption (Monbiot, 2010), to those, like myself, who maintain the film does not go nearly far enough in the critical integrity of its underlying implied analysis.

In this research, video clips are texts that are presented as integral to the arguments made since they should, in fact, be regarded as quotes and are referenced as such. Although every attempt has been made to make the written text component of this research and its findings self-contained, the study relies on the readers' viewing of the clips to understand the fullness of its meanings.

1.2 Titles and descriptors

A deconstruction of the thesis title, "*Neural narratives and natives: Cognitive attention*

schema theory and empathy in Avatar[1]", is useful for understanding the multi-disciplinary meanings employed in the study.

Neural narratives is a play on words and refers to the fact that narratives are always the *output* of neurons (or nodes) arranged in particular ways in networks, whether the networks that support them are human or in any other way biological, or are (latterly) artificial. Stories are therefore dependent on neural systems to exist and perpetuate. At the same time, the *Avatar[2]* (Cameron, 2009) storyline is very much *about* neural networks and the interplay between human, alien and artificial. In using neuro-scientific insights as an aid to analysis, I suggest that the analysis draws on the cognitive sciences to assist in the interpretation of the film's narratives and those of the audiences.

"*Natives*" refers to notions of indigeneity, a major theme in *Avatar*, but I also refer to other nuances in the meaning of the word. In a very different context, so-called "digital natives" are distributed across our planet in ever-increasing margins of inequality (and here I include myself). Since a stark boundary is formed between those with access to technology and those who will never have the opportunity to sit in any form of theatre, including one with 3D projectors and surround-sound, "*native*" alludes to, among others, inclusion/exclusion, the competition for scarce resources and the politics of identity. The word also refers to colonialism and its derogatory subversion of the word's dictionary meaning.[3] On a meta-level, its ambiguity lends weight to my argument that meanings are fluid and serve those who have

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[1] In this study the word 'avatar' is used in two senses: *Avatar* capitalized and italicised refers to the film, but lower-case avatar use refers to the generic term, as in below.

[2] The word "avatar" derives from a Sanskrit word meaning "descent," and has been largely appropriated as an electronic image that represents and may be manipulated by a computer user (as in a game). https://www.merriam-webster.com/dictionary/avatar

[3] Origin: Late Middle English: from Latin nativus, from nat- "born", from the verb nasci (https://en.oxforddictionaries.com/definition/native)

the power to fix meanings as memories. Further to this, given that a worldwide indigenous movement stands against the same sorts of power abuses endured by *Avatar*'s Na'vi and in the context of Cameron's own political sensitivities and relationship with indigenous peoples of the Amazon basin, the choice of the name *Na'vi* is a subtle reference to audiences' own fluid meaning-making as they engage with a powerful, new set of experiences and meanings associated with Cameron's use of technology, and the attention which that demands.

Cognitive attention schema theory refers directly to neuro-scientific advances in understandings of consciousness over the last 15 years, where tracking attention in animals, including humans, is becoming an exact science. This body of knowledge, which includes concepts of shared attention, mirror neuron mechanisms, mental-modelling or schema-building and the construction of self, among others, goes directly to a theory of mind underpinning animal evolution in terms of sociability and survival. It also shows promise in making many further articulations of interest to this study: individual choice in the face of evolutionary biologies, audience reception processes and ideological identity, the function of artefacts to command attention, status and respect, and the concomitant responsibilities of the artists producing these and, most importantly, the power to transform social awareness.[4]

Empathy, as a research focus, feeds into self-awareness through its role in mental model-building or, as it is referred to in this paper, schema-building. Critical theory[5] suggests that power and manipulation rely on the suppression of empathy to perpetuate. It may therefore follow that an understanding of self, as awareness of attention, could be applied to competing

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[4] "Awareness" is a term that is used in many different ways. At this early stage, the attempt will be made to use the word in this research to replace or, at least, qualify the word "consciousness".

[5] "Critical theory" refers to broad Marxist and neo/post Marxist traditions based in political economy, class analysis and the critique of captitalsim and its texts, but also in the sense that it attempts theoretical and praxic effects on "emancipation from slavery" and a "liberating … influence" in societies (Horkheimer 1972, 246).

elements of narrative construction and reception in *Avatar* to understand the power and diversity of meaning-making of the text, and its concomitant weaknesses.

1.3 Synopsis

A brief synopsis and commentary of the film, facilitated in the electronic version of this document by interactivity, is provided. This is not meant to pre-empt the textual analysis that follows in Chapters 3 and 4 but, since the literature is very broad, I feel it is productive to provide the story outline at this stage to focus the theoretical discussions. This informs my process of summarising the plot, without approaching it chronologically, in order to highlight the elements which are analysed later in this study.

The film starts with (or catches up to) a future well in progress. Earth is environmentally and socially denuded, corporations rule the galaxy via paramilitary forces in a ruthless search for more mineral wealth and science plays second fiddle to the pursuit of profit. In other words, business as usual, extrapolated to its logical future. The images that follow are web-based files designed to link to video *Play* buttons and are included here to illustrate the film's plot and storylines.

Clip 2: Science team sifts through derelict indigenous school

A school built by anthropologists on Pandora[6] has failed and development diplomacy has given way to espionage as the anthropologists embed one of their own into Na'vi culture. With military action always an option, science is given a chance by sending a recently disabled Marine's awareness into a genetically engineered Na'vi body. This invading force aims to learn key strategic information of the Na'vi's defences. In the following clip, Jake starts the bonding experience with his avatar body, originally based on his twin brother:

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[6] "Pandora is the fifth moon of the gas giant Polyphemus (both names reference figures in Greek mythology), which orbits Alpha Centauri A in the Alpha Centauri System, the closest star system to our own sun. Discovered by space telescopes at some point between 2050 and 2077, Pandora has been the single most interesting thing to happen to the human race in hundreds of years" (https:/james-camerons-avatar.fandom.com/wiki/Pandora)

Clip 3: Jake meets his avatar body for the first time

The reason for the invasion, initiated by industry, backed by military and facilitated by scientists, is the exploitation of a rare element, *unobtainium*, but resistance from the owners of the mineral, the indigenous Na'vi,[7] has escalated occupation of their planet. The following two clips show powerful visual metaphors implicating[8] the modern American military/industrial/prison complex. Besides the critique of this self-affirming model of managing these institutions and their increasing totalitarianism, this visual metaphor introduces James Cameron's critique of unbridled exploitation of our own planet's natural resources:

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[7] Note the semantic reference to "native", as in "indigenous", in the choice of the name, *Na'vi*.

[8] "Damning" may be a more apt word.

Clip 4: Spaceship lands in fortified refinery

The division of labour and its stratification is significantly portrayed in Clip 5. Power lies with the inept, non-technical owner/administrator of the enterprise, represented by Selfridge Parker (played by Giovanni Ribisi) who struggles to negotiate the sophisticated 3D geo-mapping system in the command centre.
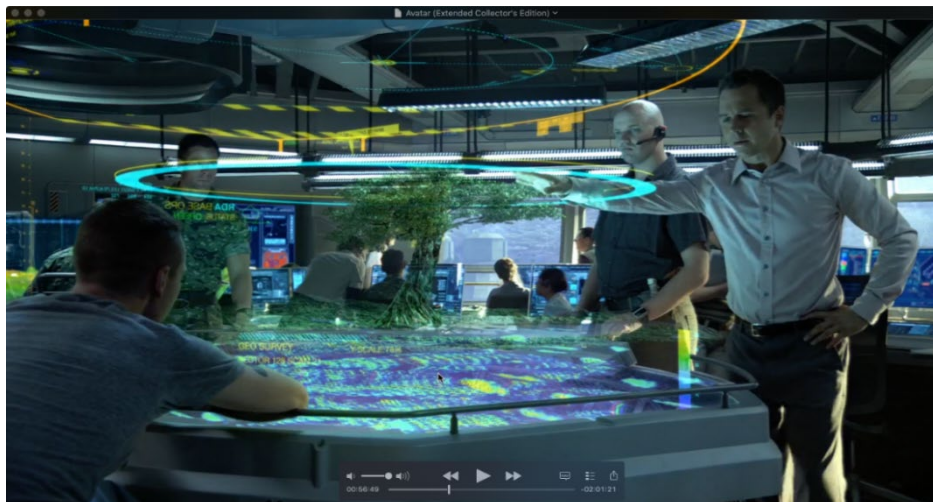
Clip 5: Corporate/military command centre

Technicians and scientists are there to be ordered about, as are the mercenaries, in that order. Yet the command structure of the occupying force is only a mirror of the hierarchies at play throughout the film's world – a pyramidical affair with capital at the top and indigenous

resource owners at the bottom.[9] In short, a reconstruction of traditional Western conceptions of dominance over nature and social realities.

The sophisticated motion graphics in this scene are very much part of the world Cameron creates as they reflect his technique of embedding one form of technology in other iterations of itself, i.e., 3D models inside the larger device of 3D delivery to audience optics. This filmic device provides a self-reflective commentary by Cameron on his medium, while creating elements of the visual "set", a sort of self-exposé of his use of simulacra, to the extent even of reminding the viewer of the illusory nature of the experience. This scene also lays out the basis for the inevitable conflict which will ensue as a result of an indigenous village built on the largest deposit of *unobtainium* as its members fiercely resist relocation.

But Jake relates too closely to the embodiment that comes with his occupation of an avatar body and, through the cultural insights that result from his relationship with Neytiri,[10] he changes allegiances and ends up playing the saviour,[11] an aspect that has been severely, but not universally, criticised. The primary conduit for Jake's change of heart is romantic love, but his actions are motivated ultimately by altruistic rationality. Convinced of the moral integrity of his treachery to his officers, country and species, he puts non-material values above those of his mission and reaches a higher[12] level of consciousness. However, consciousness is depicted as itself material, as in the sharing of the Na'vi bond in the following clip:

[9] Virtually on a par with the animals that populate Pandora.

[10] "Neytiri te Tskaha Mo'at'ite is the Na'vi princess of the Omaticaya clan. She is the second-born daughter of Eytukan and Mo'at and younger sister of Sylwanin" (https://james-camerons-avatar.fandom.com/wiki/Neytiri).

[11] "The avatar allows Jake to see, hear, and otherwise 'sense' the Na'vi culture, and the audience needs the same conduit to the Na'vi. Jake is OUR avatar" (Lyubansky, 2009).

[12] "Higher" as in more inclusive of others' awareness and the imperatives that come from that awareness; a less ego-driven relationship with oneself and therefore a more "spiritual" cultural experience.
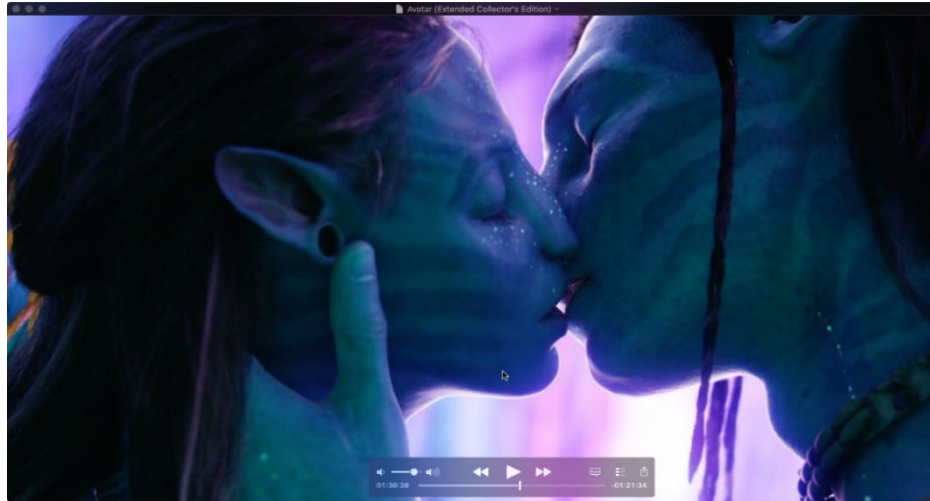
Clip 6: Jake and Neytiri share first kiss and neural link

The Na'vi neural link, something they share with other species on the planet and, through the trees, with Pandora itself, is something not physically available to humans but an abstract and emotional schema of this link is possible. This is where Cameron's ambition exerts itself in attempting to elicit the possibility of greater, more meaningful connectedness with audiences.

With their love guiding their actions in the context of a communal acceptance of something akin to fate and myth, the pair of lovers, Jake Sully and Princess Neytiri are powerless to stop the carnage and now, mistrusted and bound by the indigenous, they witness their people suffer a ruthless military assault:

Clip 7: Military airstrike against the Na'vi

The plot plays out with Jake, in his Na'vi form, accessing deep, sacred warrior tropes, heroically taming the near-mythological creature Toruk,[13] to unite all Pandoran life forms against the alien invader. By this time, most viewers would have picked sides or, more precisely, as Stuart Hall (1973) would argue, negotiated a preferred meaning.

Note the silent body language exchange between Jake and Parker in Clip 8, with Parker casually strolling with his hands in his pockets as if to indicate that his actions were merely administrative, lacked personal responsibility and that he's available for the same job if the indigenous so wishes – an inappropriate suggestion and typical of what Cameron might call the result of a sociopathic economic system which refuses to take responsibility for its actions.

Interestingly, the indigenous warriors now have modern weapons, mirroring the development stage of leapfrogging into more advanced stages of capitalism through the appropriation of technologies, although this reference is unlikely to have been intended.
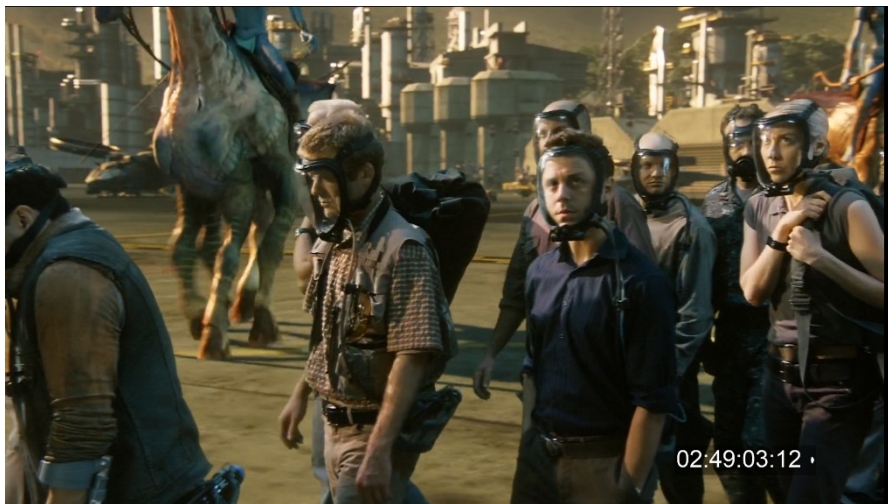
Clip 8: Alien invaders leave Pandora in disgrace

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[13] "The Great Leonopteryx or *Toruk* is a species of airborne predatory animals native to Pandora" (https://list.fandom.com/wiki/Characters_and_wildlife_in_Avatar).

The ending obviously allows for sequels but gives bold political statements in Clip 8 asserting Cameron's ideological position in a dramatic name-and-shame parade which makes clear both the future story tension lines and his own ideological imaginary. The sequels to *Avatar*, already in production (Libbey, [s.a.]), continue to build on the original[14] with additional transmedia iterations, from games to theme parks,[15] and a massive fan base[16] which has embellished storylines and character profiles beyond anything published by Cameron. In this way, the film is accumulating meaning diversity, polysemy, in multiple ways, through the years and over the stories that are spawned by the original.[17]

1.4 Thematic treatment

The *Avatar* thematic world is both simple and complex and operates in an intricate interplay between the mental models and value systems of conflicting story elements and profound character development. This section sketches the thematic treatment of this interplay between story elements and how they are achieved by concentrating on the film's use of neuroscience in its content and techniques. For example, the 3D effect of the Hallelujah Mountains, its scientific significance and Jake's ignorance of science are presented in one compound scene in Clip 9:

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[14] Albeit out of chronological sequence.

[15] https://www.youtube.com/watch?v=WMxeDMPvSnI&t=6s

[16] See, for example, http://www.fanpop.com/clubs/james-camerons-avatar

[17] See, for example, this story based entirely on the Toruk creature from *Avatar 1*: https://james-camerons-avatar.fandom.com/wiki/Toruk_-_The_First_Flight
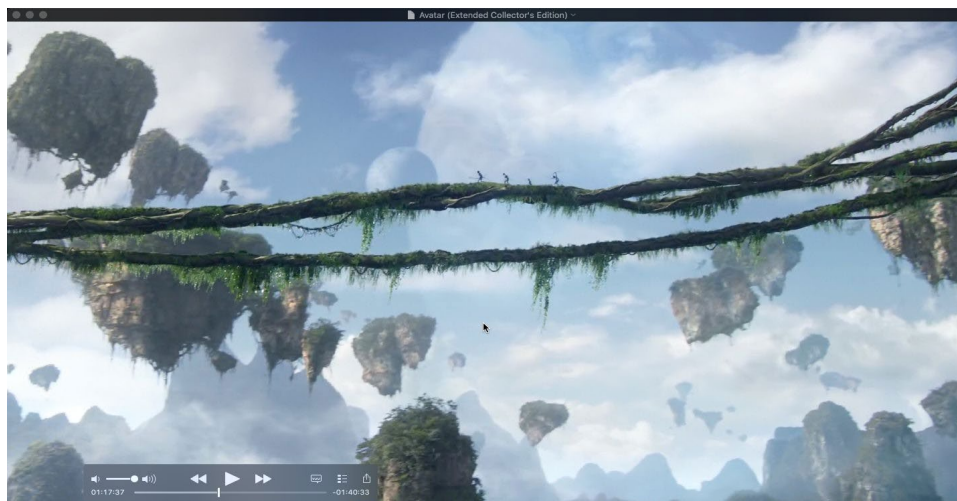
Clip 9: The hanging rocks of Hallelujah Mountains

Visual processing in our brains required for the optical illusion that is 3D is still a novel experience for most audiences because of a palpable subjective sophistication in the experience. Adapting our neuron pathways to experience 3D is interventionist in nature as it monopolises that way of seeing to the complete exclusion of our usual pathways. This contrasts with Jake's naiveté and, I would suggest, acknowledges our own gullibility and places us as subjects to the film, its messages and our own complex responses. For Cameron, the emotional effect of the disruption of our usual perceptions opens up what Pop (2009) calls the "double mirror",[18] which, Pop explains, operates at many levels. One of these levels works with the spectacular, providing a fantastical and romantic digital world which inversely mirrors a dystopian version of our own. In the aesthetic beauty of Pandora, its culture of connectedness is higher than the mundane horizon of value and emotional integrity. In this way, Cameron introduces the possibility, however fanciful, of other imaginaries of our future. The weaving of elements to support his strategy for changing audience minds using cognitive

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[18] "In a word, Pandora is everything Earth is not, and, by consequence, the world we enter by magic is a complete reversal, a mirror replica of our own world. This is again the double mirroring we are looking for – Pandora is a negative replica of our own world, and in the same time the movie is mirroring for us, at an individual level, a dimension for escaping from reality into an artificial reality that is so palpable we cannot elude its attractiveness" (Pop, 2009: 25).

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insights is built on existing, traditional narratival themes via a juxtaposition of opposites. The binaries created allow audience choice of meaning-making. In rejecting the violent, unjust, psychopathic, stereotypical values and the resulting self-destruction, audiences move towards the opposite values held by the film.[19]

However, Hall (1973: 92) referring to media, said that "to put it paradoxically, the event must become a 'story' before it can become a *communicative event*". This means that the encoding needs to take place largely in existing narratival forms to make the meaning common to audiences. There is much to be unpacked in the meaning-making process and this is explored in Chapter 3.2. The next section isolates some of the more important strands of these values and then highlights the resulting binaries.

Clip 10: Indigenous sacred ceremony

The contrast between spiritually emotive scenes like those above and the seemingly damning critique of the US military industrial complex, as in Clip 11 below, forms the visual

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[19] This is however not a seamless, simple process. Hall (1973) ,and many following him have established that meaning is negotiated through a process of rejection and acceptance of discourse. Dominant and oppositional meaning provide the backdrop to that negotiated response. But there is much more to this, for example, the process of *neutralisation* whereby meaning is reinterpreted in terms of dominant/hegemonic ideologies, whatever the values of its creators.

landscaping – the backdrop of good and evil of the film.
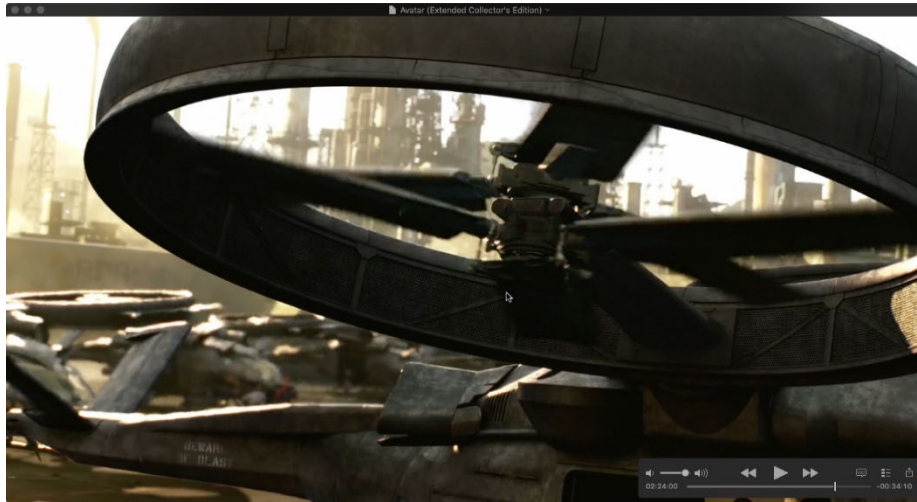
Clip 11: Gunship rotor blades and refinery background

The plot, with its undertone of impending disaster attached to macro-economic realities and the hope of escaping this scenario in our "real" world, forms another theme where the contrasts in the aesthetics of nature versus those of polluted, heavy industry again mirror real life crises and options. Cameron uses his 3D scalability to full effect in Clip 12, showing the massive scale of open cast mining on Pandora, reflecting what is happening now in the Amazon, amongst other areas:
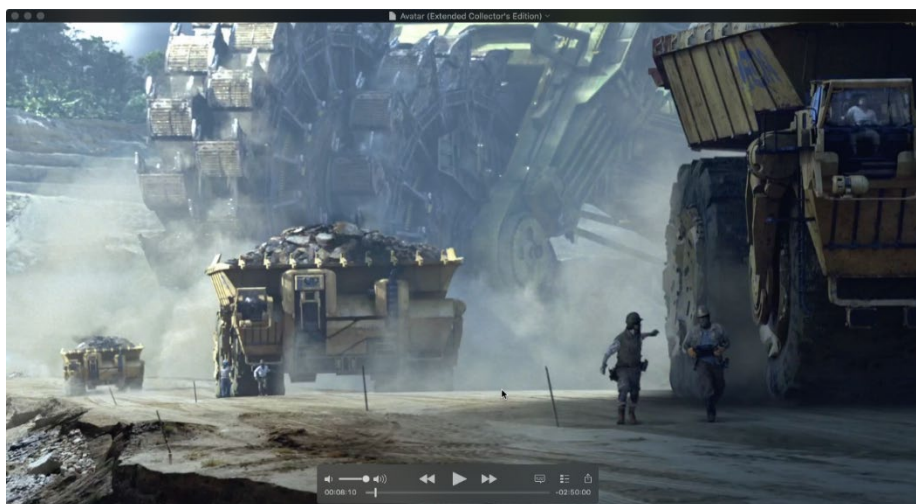
Clip 12: Opencast mining on Pandora

Promises of solutions provided by increased empathy and awareness of environmental degradation is what drives the activism[20] of James Cameron. While the degradation of forests has devastating consequences for the world of work and survival, *Avatar* is also very much about the value of play. The ability of computer-generated imagery (CGI) to create aesthetically pleasing exotic landscapes as fun escapist scenes where Cameron elevates play as a simple joy and essential therapeutic cultural practice, as seen in Clip 13 below.
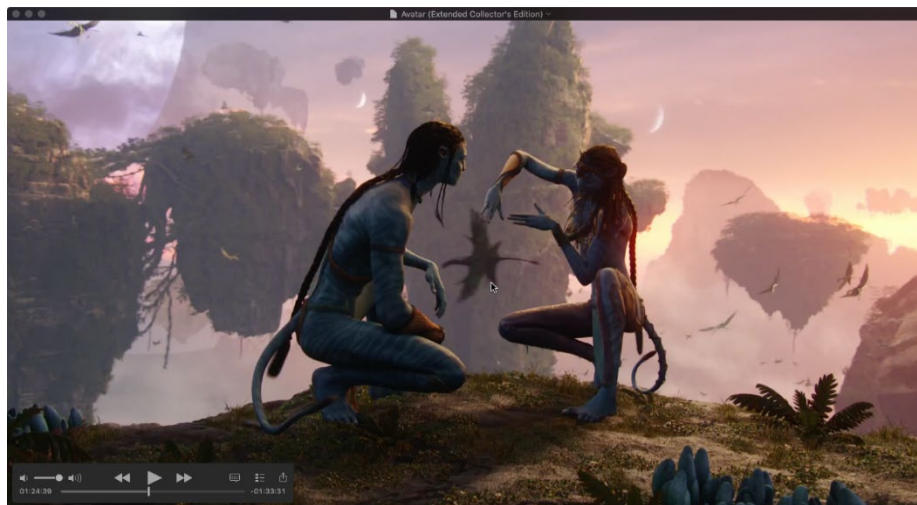
Clip 13: Jake and Neytiri relive the day's flying

Although the romantic trope is extensively exploited in this film, there is another layer to the tremulous tension usually faced by prospective lovers – species differentiation. One of the more interesting cognitive discourse innovations in *Avatar* is the way Cameron plays with embodiment. The following scene, Clip 14, shows the feeling of hyper awareness at the point of initial sexual association, made more poignant by the characters' (and their viewers') knowledge of the ambiguity of their species and its implications. Cameron undertakes an

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[20] This promotional clip is intended to appeal to a general internet audience. It is also a public endorsement of Earth Day 2019 in the context of *Avatar 2* production imperatives; an articulation of Cameron's value system, specifically the need for "warrior" activism (significantly couched in an appeal to young US voters to register in the 2020 presidential elections). See https://www.youtube.com/watch?v=9t1egSivOro

ambitious experiment in empathy and transference, which is explored in depth in Chapter 4.1 but, as will be explained, this is no easy task. The trope of romantic love achievable across species and despite hardship, war, betrayal and group loyalty, must be crafted incrementally and subtly, as in this first sexually oriented communication and physical contact. The suggestion of sexual union between Jake and Neytiri is a challenge to our own body boundaries but, since they are of the same species, we are more likely to gradually accept this, especially couched as it is in human romantic love and emotion. The limits of what audiences can process as acceptable visual representations and conceptual models of the human body are Cameron's major challenges in the film.
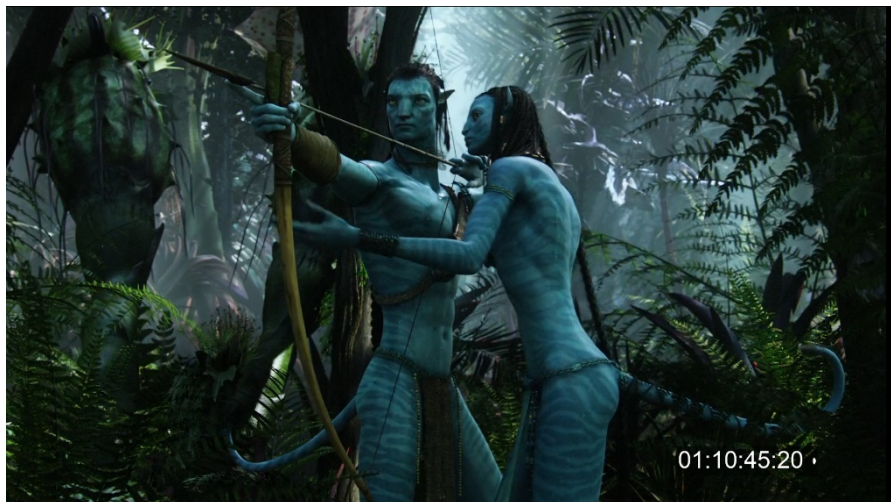
Clip 14: Jake and Neytiri breach personal body space

What is normal, even sanctioned, in the prevailing, hegemonic inter-gender binary in *Avatar* is extended explicitly in the scene above. The suspension of belief thrust on the viewers at this stage is a mere introduction to the logical conclusion of the trans-species implications of the romance they are required to accept as the film unfolds. Cameron is not only content with revisioning physical romance, but also with re-articulating masculinity mainly through the development of Sam Worthington's character, but also in the depiction of indigenous male aggression and competition. Although Tsu'tey is fiercely antagonistic towards his rival for

Neytiri's affections and, after Jake's heroic actions, both men accept her decision in a way that is protective, but honourable – like Marines used to be. But, in depicting resistance in this way, there is the possibility to model indigenous masculinity as empowered and resistance itself as honourable.

Clip 15: Tsu'tey in full fighting flight

Action-packed, masculine heroic adventure scenes abound in the film and Cameron is at pains to show that women have their equal place in them. In the following scene in Clip 16, woman warrior Neytiri shoots Colonel Quaritch (played by Steven Lang), the alpha macho commander of the military invading force, with a traditional male bow and arrow, so saving Jake who, at this stage, lies helpless in his avatar life support system.

Clip 16: Colonel Quaritch struck by Neytiri's arrow

But sexploitation is subject to changing cultural forms and norms as Donna Haraway (1989) describes:

> *Reproduction has become the prime strategic question, a privileged trope for logics of investment and expansion in late capitalism, and the site of discourses about the limits and promises of the self as individual.*

The film's producers truncated the following scene from the film version (Cameron, 2010) since the notion of alien sex is fraught with discomfort and ambiguity despite allowing multiple entry points for audience meaning-making, for polysemy.
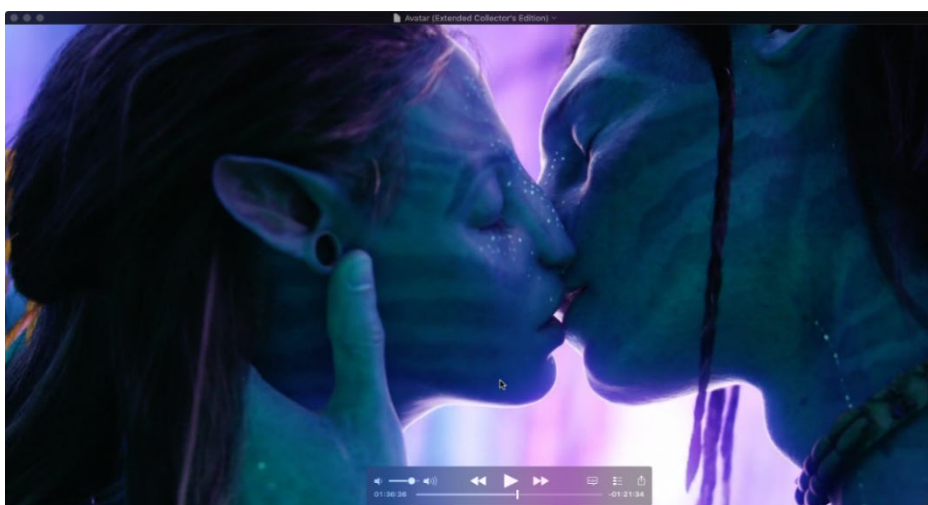
Clip 17: Jake and Neytiri share first kiss

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The film's liberal use of thematic binaries is represented visually in the next section as diptychs. Consider, for example, the way Clips 18 and 19 set out to contrast moments of good and evil:

Clip 18: Seeds of the tree of souls

Clip 19: Direhorse on fire

Clips 20 and 21 juxtapose machine and biology:
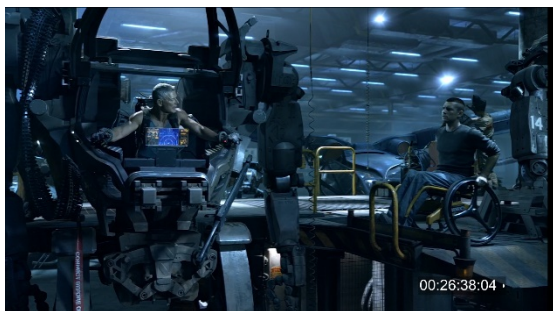
Clip 20: Quaritch promises Jake real legs

Clip 21: Helicoradian plants snap shut

Warrior worker and hunter/gatherer binaries are teased out in Clips 22 and 23:

Clip 22: Pilot Trudy Chacon checks gunship

Clip 23: Na'vi hunts hexapedes

Sacred and profane is an ongoing binary, characterised in Clips 24 and 25:

Clip 24: Neytiri with Sacred Tree seeds

Clip 25: Selfridge and his *unobtainium*

Alien and indigenous, and the shifting meaning of "alien" is explored, for example, in Clips 26 and 27:

Clip 26: Kids play with Augustine's hair
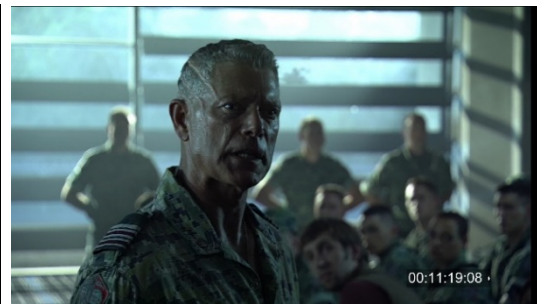
Clip 27: Quaritch gives orientation briefing

Manufactured and organic realities and environments are juxtaposed in Clips 28 and 29 but the association of technology with evil and the opposite for organic are not convenient binaries. Rather, technology is presented as a necessary evil and the organic as a partial (but nevertheless utopian) mediator:

Clip 28: Jake enters the avatar chamber
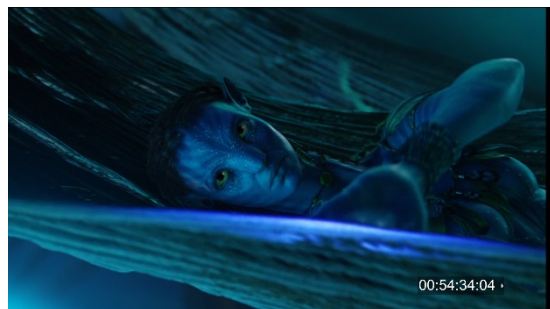
Clip 29: Neytiri sleeps in her forest canopy

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Underpinning these major themes are those supporting the use of newly emerging neuroscience, genetics and artificial intelligence, as depicted in Clip 30:

Clip 30: Jake's awareness transported to digital media

Neuroscience and ideas of planetary consciousness are presented as different forms of the same thing – the one technological, the other organic. Clip 31 shows how this consciousness is elevated to the sacred:

Clip 31: Jake is reborn Na'vi

More detail on the elements mentioned above will be offered in Chapters 3 and 4.

1.5 Problem statement

The dominance of Hollywood values in cultural meaning-making as part of the cultural capital available to a globalised audience is deeply entrenched. The acceptance of the "eco-tropes" now in use by fictional films like *Avatar* serves to subvert serious understanding of indigenous community issues and masks the mechanisms of global economics. Evidence that certain indigenous groupings have approached Cameron to be their champion abounds on the internet (Phillips, 2010), as is his enthusiastic response to them. This study challenges popular conceptions of the film as in any way revolutionary, beyond the key-tracking technologies used for the compositing production of its images and the innovative 3D camera system James Cameron designed to execute his vision.

By re-evaluating some of the basic terms of this wide-ranging criticism, this study argues for an understanding of *Avatar* that explains its achievement in offering a successfully polysemic meaning-making experience for the audience, despite its many contradictions. In so doing, the study investigates the responsibilities of the artist in meaning-making in the creative acts of the production of cultural objects. Emerging conceptions of the self, provided by cognitive attention schema theory, provide more analytic substance to post-modernist notions of the self and its relationship to the body, and this, in turn, enables a synthesis between historicist, discursive critical traditions and cognitive science, especially in literary and cultural criticism (Fairclough, 1992; 2003; Hogan; 1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015, Herman, 2007; 2013).

1.6 Aims

The aims of the study are firstly, to show the complementarities of cultural studies and cognitive science in the critique of cultural objects and, secondly, to undertake a cognitive

and cultural materialist analysis (Williams, 1977) of *Avatar* through those lenses. The selective application of this interdisciplinary approach contributes to an understanding of what cognitive cultural studies research denotes with reference to the recent increasing accessibility of knowledge about the brain.

1.7 Objectives

The objectives of the study are to select some of the literature pertinent to a creative synthesis of theoretical positions, as described above, and to show that meanings and interpretations of the subjective experience of *Avatar* are made discursively as negotiated meaning, but are nevertheless situated in definable historic traditions, mores, values and power relations. Simultaneously, this study endeavours to show that, while the cognitive and species-specific biological components and working mechanisms of humans provide for a vast range of cultural possibilities within our own bodies' confines, a critical, discursive approach is essential to make sense of the way the elements of history and biology fuse in any one moment, in any particular culture. In undertaking this research on this specific film, the impact of emergent cultural phenomena in digital media is assessed for its contribution to contested meaning-making and a rapidly increasing global media literacy.

1.8 Domain of the study

The domain of this study is the interdisciplinary fields of film, narrative and cognitive cultural studies, and their intersections in the literary and cultural criticism of individual cultural objects.

1.9 Limitations of the study

This study is situated firmly in the critical tradition of the humanities and, although scientific paradigms are much more accessible today than ever before, I cannot make claims as a

physical scientist. But there are rich insights from authors in the relevant literature who *do* combine physical and social scientific and philosophical expertise (Hogan; 1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015; Ramachandran; 1998, 1999, 2003, 2004, 2011, Graziano; 2011, 2015, 2017a, 2017b, 2019; Gonzalez-Franco; 2018; Boyd; 2005, 2009, Herman; 2007, 2013a, 2013b, et al) and I refer to them in the normal scholarly manner.

It is one of the challenges of this study to be selective in the choice of relevant theory which facilitates the application of attention schema theory (Graziano, 2011, 2015, 2017a, 2017b, 2019) to constantly seek to relate the theory to its central thread of how attention is exercised in the appreciation of cultural objects. In this sense (and in others), attention is contested ground, but the study takes the concept of attention further than the late capitalism commodification of "attention by attention merchants", as Tim Wu (2016) frames the problem.

The problem here is not only one of political economy and economic history. In this study, attention is taken as a basic building block of awareness, the sense of ourselves as subjective entities, and the driving force behind the existence of cultural objects, not only their profitability.

There is no doubt that attention is contested and manipulated, especially subjected to a consumerist economic order. Although I accept and am informed by thorough economic history and political economy analyses of the culture industries, such depth cannot be fully encompassed into this analysis. Rather, I look at the role of attention in the production and marketing of *Avatar* as they pertain to meaning-making in the film and its transmedia iterations. To effect that, I need to empathise with audience responses.

Furthermore, while conducting the study, I am acutely aware of the challenges in making

claims about individual subjective understanding and meaning-making of any product, when it is now so widely known that meaning-making is highly divergent in its subjective experience. It is necessary to make the distinction that, when I speak of meaning-making, I cannot restrict it to the meanings an artefact is assumed to hold for audiences. What is really under discussion here is the *process* of making meaning, not its results. In other words, an audience member does not make meaning of an artefact – rather we are involved in a constant process of mental model-building where viewing an artefact such as *Avatar* is one of the inputs into that process, which may occupy our attention to a lesser or greater extent, depending on our state of attention, itself at the mercy of a multitude of factors.

1.10 Theoretical framework

The theoretical and intellectual project of this study is to provide for a critical analysis of a media product (artefact, object) in such a way as to contribute to the transformative power of literary and cultural criticism (Fairclough, 1992a, 1992b, 1995, 2001, 2003, 2014); Hogan, 1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015; Herman, 2007, 2013)

This allows the analysis to combine relevant theories from post-modernism (Foucault; 1961, 1972, 1983, Hogan; 1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015, Fairclough; 1992a, 1992b, 1995, 2001, 2003, 2014) and cultural studies (Williams; 1961, 1977, Hall; 1973, 1977, 1980, 1983, 1996, 1997, 2001) with the insight that the self and social consciousness are evolutionarily and biologically constructed (Graziano; 2011, 2015, 2017, 2019) yet fragmented in their ontological, subjective and cultural experiences (Van Dijk; 1995). Similarly, this deconstruction fits comfortably in a search for how social construction interacts on a human biochemical level by referring to the wealth of cognitive psychology that has integrated the latest insights of the neuro-cognitive sciences into theories of how and why

consciousness is reconceived as the awareness of attention states. The interdisciplinary field of cultural studies serves to unite critical theory with cognitive theories around meaning-making, which are framed as both sociocultural and cognitive processes.

Every academic discipline has its own theoretical demarcations, each with its own focus in making meaning of data deemed worthy of expression, memory and explanation. In parallel, every discipline has its historical ontology, built through complex sets of both sudden insights and discoveries, and gradual discursive formations, aggregated by abstract categorisation over time – rough models of privileged memory. In the approach used in this study, I use "meaning-making" as the focus for multidisciplinary syntheses but, as is made clear in Chapter 2.2, meaning-making is a subset of a larger process of mental model-building or schema.

Turning to an applicable paradigm, the field of cultural studies is historically rooted in a sociological approach and focuses its theoretical concerns on societal and group categories. It has done so because of the dearth of convincing objective knowledge pertaining to the working of the minds of individuals. Informed by the criteria established by historically materialist theories of social science, it shelves this responsibility, thereby delegating a very basic building block in understanding to psychology and that domain's historically cultural variants. The same, very broadly speaking, applies to discourse analysis which, although concerning itself with texts produced by individuals, situates them in broad societal processes. Again, literary criticism, with its concern about individual texts, individual artists and their bodies of work, follows the same pattern.

Conversely, psychology has concerned itself with the individual, branching out later to the dynamics of initially small groups until (with the help of statistical models and sociology) it can make claims about larger societal formations and their behaviours. However, with recent

(and sudden, historically speaking) advances in cognitive scientific knowledge brought about by technical processes, such as electroencephalography (EEG) and functional magnetic resonance imaging (fMRI) and the like, this process of evolution in these historical paradigms has begun to traverse and transcend exclusive intellectual barriers by birthing new disciplines and building bridges between old, seemingly intransigent ones. In this context, this study makes the broad claim that meaning-making is both a cognitive process subject to physiology and a social process subject to historical discourse, constructed by a continuous process of contestation between residual, dominant and emerging ideologies.

Stuart Hall (1983: 50) points to similar differentials based on prior ideological positioning:

> *... But both residual and emergent cultural forms are important, not only in constituting moments of contestation with and resistance to the dominant cultural forms, but also in constituting the ongoing process by which the dominant cultural forms are able to change and adapt to new circumstances precisely by incorporating such residual and emergent forms (e.g., think of the first time that hippies appear on the cover of Time magazine).*

Teun Van Dijk (1995) speaks of the dynamic of inclusion and exclusion of dominant and emergent cultural forms in respect of othering, whilst Michael Graziano (2011) elaborates on the role of mental models of the self and of others as a basic function of the self. These linkages in theory are further unpacked in Chapters 3 and 4 of this study but here each prong increases understanding of polysemy in *Avatar* and lends weight to the validity of a multi-disciplinary approach to its understanding. As such, this mixed toolset is prevalent throughout this study, but the weight of the arguments' reliance on each set of theories shifts across the chapters. For example, in order to understand the meaning-making options *Avatar* provides for empathic response, the study benefits from the descriptive power of a discourse analysis

of the text itself to lay bare the nitty gritty of semiotic exchanges between the film's characters and between their worlds.

As art historians, interested in meaning at the point of production and reception, an analysis of meaning-making needs to uncover all the often-hidden elements of the artefact's construction to proceed with the task of placing the film in its historically defining context. By revealing the ways in which the film represents, in this instance, Hollywood's commitment to power inequalities, status quo interests and market values, and how these inform *Avatar* audiences' meaning-making, the pressures brought to bear on individual artists' creative output and their accompanying social and historical responsibilities can be more clearly appreciated.

An analysis informed by deeper understandings of cognitive processes can reveal more of how these subtly coercive forces work. It follows then, that the success of this particular study can be qualitatively assessed by the degree to which it reconciles the dichotomy of culture and cognition in a unitary, plausible representation of the recent interest in a newly conceived field of "cognitive cultural studies" (Zunshine, 2010).

1.11 Research Methodology

This study accepts that the cognitive turn in film theory and literary and cultural criticism is well established and that what is contested is not its fact but the forms in which cognitive studies interact with social scientific methodologies. In other words, in this case, the study applies cognitive insights, neither unquestioningly nor speculatively but critically, asking how best to approach these new insights in their interactions with critical traditions in the arts. The study is, by its nature, qualitative although it does rely extensively on quantitative data from the cognitive sciences derived from theories that deploy scientific methods of observation,

research, hypothesis, data records, conclusions and replication, and their variants (Ramachandran; 1998, 1999, 2003, 2004, 2011, Hogan; 1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015, Graziano; 2011, 2015, 2017, 2019, et al).

Following the cultural materialism introduced by Williams (1961, 1977) and taken further by Hall (1973, 1977, 1980, 1983, 1996, 1997, 2001) the study uses, as its method, the systematic identification of ideological phenomena present in a cultural object such as a film. Early cultural studies theorists[21] held that vocabularies[22] give an appearance of stability when used in a cultural artefact and inequalities in power, and representation can be identified by historical shifts in word usage and meaning. Tracing the vocabularies that give each moment an appearance of stability, Williams was able to reveal the combinations of word usage serving as indicators of the contradictions at work within societies. These insights continue to be shared by theorists like Noel Chomsky[23], Herman; 2007, 2013, Fairclough; 1992a, 1992b, 1995, 2001, 2003, 2014, van Dijk; 1995, et al.

While "conducting properly controlled experiments" is not the appropriate method for this study, I am guided by explanations that include:

> *[t]he total set of details of heterophenomenology, plus all the data we can gather*
> *about concurrent events in the brains of subjects and in the surrounding*
> *environment, comprise the total data set for a theory of human consciousness. It*

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[21] The early cultural studies roots also situated in the literary criticism and semiotics of Barthes and Saussure, amongst others, and cultural studies theorists like Raymond Williams, Richard Hoggart, Stuart Hall, E. P. Thompson, David Morley et al. were influenced most powerfully by seeing language (and texts) as cultural artefacts created in the service of power, or as resistance to it.

[22] In the broad sense of media literacy.

[23] Although Noel Chomsky's work in linguistics both preceded and succeeded William's.

I have admittedly read only a very brief selection of Chomsky's vast output, much of which I found too complex to comprehend with my lack of grounding in linguistics.

leaves out no objective phenomena and no subjective phenomena of consciousness
(Dennett, 2003: 20).

Cultural studies theorists employ models of a circuit of culture (Du Gay, Janes, Mackay & Negus; 1997, Hall; 1973, 1977, 1980, 1983, 1996, 1997, 2001) as a methodological framework when examining a cultural artefact and the multi-dimensional representation of all its aspects. With the cognitive dimension factored in, the circuit could be reconceived with cognition[24] as the enabling additional element, depicted in this diagram:
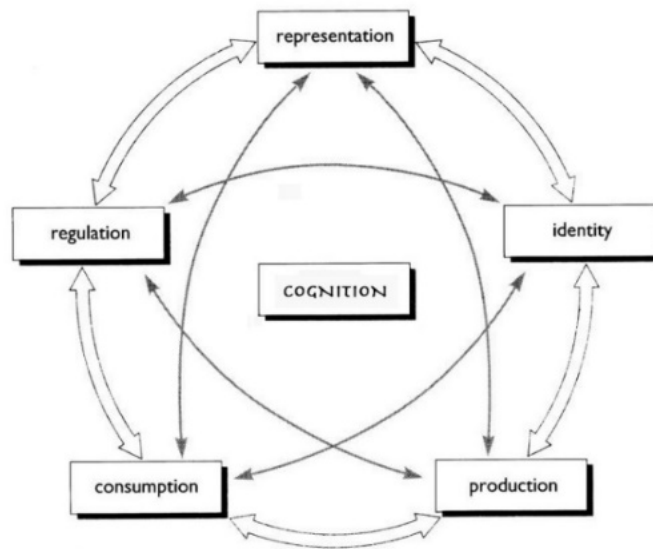
Figure 1: Circuit of culture

Modified from Du Gay et al.(1997)

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[24] In the broad sense of intelligent systems, including animal and artificial.

1.12 Ethics

While there are no ethical considerations in respect to human participation in this research (since there has not been any field research), all research requires ethical formulations, and these have been observed. There have been no personal interviews conducted. In answering the "so what" interrogation of academic research, I maintain that this research is relevant academically, socially and artistically as it amplifies empathy in the structure of social communication in general and artistic expression specifically.

1.13 Argument and chapter and outline

Polysemic, often contradictory and even paradoxical ranges of meaning-making by *Avatar* audiences are revealed in media responses to the film. A cogent argument is made that the analysis of those responses necessitates the use of cognitively oriented models of explanation. These originate very broadly in biology and, more specifically, in neuroscience, cognitive narratology and certain conceptions of critical discourse theory. These are collectively adapted as a fresh approach to cultural studies and contribute to the project of reimagining the field as *cognitive* cultural studies.

Foregrounding the research foci choices made in this study, literature on cognitive narratology is explored in Chapter 2.1 to harness the thought of Hogan; 1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015, Buckland; 2000; Casagrande; 2004; De Borst & De Gelder, 2015; Herman; 2007, 2013 and others, for the purposes of understanding meaning-making in fiction.

Providing challenges to narratives that take as their rationale and value the development of human consciousness requires an additional approach. Chapter 2.2 explores the considered engagement with the literature on mental models that may give rise to further, in-depth

comprehensive findings on polysemy. The relevance of cognitive neuroscience and its relationship to understanding polysemy is broadened to other frameworks of *Avatar*'s narratives. Networks, neuro-technology and neuro-marketing are shown for their innovative and creative relevance to meaning-making in emerging production cultures of the fictional film industry.

Chapter 2.3 makes the case that debates of the responsibility of academics and artists in both their individual and social capacities are greatly enhanced through the lens of attention schema theory. The argument is made that the scholarship itself indicates the power discursive formations have in influencing meaning-making of cultural artefacts, in this context, exercised by many academics themselves.

This is accomplished by structuring an argument based on a discourse analysis of the text across Chapters 2 and 3 that places attention schema theory (Graziano; 2011, 2015, 2017, 2019) at the centre of discussions of an analysis of *Avatar* and, by extension, at the heart of cognitive cultural studies. To do so, Chapter 2 interrogates attention schema theory for its value in providing insight into a theory of mind employed by humans in making meaning by showing how that process relates to the construction of self. Graziano's theories (2011, 2015, 2017, 2019) are applied to an analysis of how attention is deployed in *Avatar*.

Analyses of *Avatar* are extended in Chapter 3 with the additional specificity of empathy. This is partly due to constantly emerging understandings in the research process but also because the preceding chapters lay the groundwork for completing the analysis. Hogan; 1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015, Boyd; 2005, 2009, Fairclough; 1992a, 1992b, 1995, 2001, 2003, 2014, and Van Dijk; 1995, are used extensively in these chapters but broad understandings that provide for a more complete analysis of *Avatar* are found in

fields of study not necessarily covered by an exclusively critical discourse analysis. Therefore, these chapters provide the case study specificity required to demonstrate the arguments around the use of attention and empathy in meaning-making in *Avatar* and the overarching project of the work to put the "cognitive" back into cultural studies.

The conclusion, Chapter 5, collates and evaluates the findings relating to the central problem of the study which is an explanation of *Avatar*'s achievement in offering a successfully polysemic meaning-making experience for the audience, despite, or perhaps because of, the many contradictions.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

The literature, as part of the research matter of this project, has been chosen across three modalities: through the lens of cognitive attention schema theory, insights of narrative and of consciousness are selected and through the lens of indigeneity, identity and exclusion, empathy is explored. Literature specific to case studies of *Avatar* is spread across all three sections. Conclusions drawn from these bodies of literature are then presented in the form of findings at the end Chapter 2.

2.2 Cognitive attention schema theory: Mechanics of narrative

The aim of this section is to outline the literature relevant to the topics of discourse (Foucault, 1972; 1983), meaning-making (Hall, 1974; 1980; 1997; 2001) and the narratology, cultural stereotyping and framing of the exotic other in the context of cross-disciplinary cultural criticism (Alessio & Meredith, 2012; Anderson, 2009; Madzoski, 2013; Hughey, 2014; Hogan; 1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015, Schuller; 2013; Tisucká; 2014). To effect this process of synthesis, the relevance of cognitive neuroscience and its relationship to understanding storytelling is explored. In other words, narratives and their relationship to networks, neuro-tech and neuro-marketing are investigated for their relevance to meaning-making in the fictional film industry.

Cognitive narratology is explored here to harness the thoughts of Hogan (1999, 2001, 2003, 2004, 2005, 2006, 2009, 2011, 2014, 2015), Buckland (2000), Casagrande (2004), De Borst & De Gelder (2015), Herman (2007, 2013), and others. This chapter discusses the framing and scholarship pertaining to this broad thread of thought and its relevance to an analysis of *Avatar*. Therefore, this section situates recent research developments in the fields of

narratology, literary and discourse criticism informed by advances in biological sciences, arguing for the state of knowledge of the brain and its evolutionary, personal/subjective and social mechanisms as a theoretical juncture. But culture remains the central focus of this theoretical synthesis.

Many diverse theoretical approaches apply to the notion that the mind's functioning is intimately connected to the body and they all acknowledge the biological underpinnings of culture. They include the "naturalistic explanation of culture" (Sperber, 1996), the "biocultural approach" to cultural texts and objects (Boyd; 2009, Krajewska; 2014), the "cognitive turn in humanities" (Richardson, 2010) and the "cognitive cultural interplay" (Zunshine, 2006; 2010). The key insight in these approaches to the analysis of cultural texts and objects is that culture arises out of the particular capacity of human cognition to innovate technologically, to think symbolically, and to record and reflect; therefore impacting on how the humanities approach culture and biology (Krajewska, 2014: 59).

To this effect, Krajewska (2014: 36) summarises the work of Boyd (2009) and Richardson (2005) thus:

> *1. Culture is information that people acquire from others by teaching, imitation, and other forms of social learning. 2. Culture change should be modelled as a Darwinian evolutionary. 3. Culture is part of human biology. 4. Culture makes human evolution very different from the evolution of other organisms. 5. Genes and culture co-evolve.*

Not only does Krajewska trace a clear ontology between biology and culture, but she indicates ways in which scholars are breaking down mental processes as behaviours:[25]

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[25] See Graziano (2017).

The biocultural approach targets the essence of life management as an adaptive organisation of a variety of behaviours. These behaviours include such strategies as problem solving, provision of access to resources, reproduction and status seeking, and are fundamental in biology and therefore in culture too. The debates about the compatibility of the humanities and sciences are rendered marginal when culture is revealed as having a biological centre (Krajewska, 2014: 27).

Therefore, in the theoretical approach taken in this study, a conscious attempt is made to collapse (or cross-pollinate) the traditional divisions in biology knowledge systems and theory dealing with culture. As David Herman advises, what is required to transcend binaries of "legible and illegible animal minds"[26] is the development of

techniques for documenting and analysing the attested range of mind-ascribing practices in a given culture or subculture, as they manifest themselves in non-fictional as well as fictional narratives anchored in a variety of 'discourse domains' (Herman, 2017).

Using discourse domains in the sense of the frameworks needed to "determine what sorts of ascriptive practices will be governed by norms that cut across the fiction/non-fiction distinction" (Herman, 2017: 196), Herman argues that mind-ascription acts always manifest within particular areas of practice or discourse domains and that such domains then "determine when, to what extent, and in what manner it is appropriate and warranted to impute subjective experiences to others, non-human as well as human" (Herman 2017: 197). *Avatar* is, amongst other categorisations, an animated CGI film and, as Sean Cubitt argues,

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[26] Particularly poignant in *Avatar*.

considering the utopian dimension of CGI animation:

> *(b)reaking coherence, presenting the non-identity of the image, is not necessarily or only a sign of failure. It is in the interstices between layers that the imagination is freed to explore Pandora as a possible world: to think, even briefly, against Leibniz, that not our Earth but Pandora is 'the best of all possible worlds' …. Animation does not share this need to reconcile opposites, as almost any Donald Duck cartoon demonstrates. There remains in animation the possibility that the tear in the heart, the fault in reality, the rifts in the social are not reconcilable, but equally that worlds can be generated in which those features operate differently* (Cubitt, 2012: 230).

Applied to *Avatar,* Cubitt's observation points to Cameron's very modest and pragmatic view on social change and the attitudes likely to give rise to that change; a view that recognises that current social divisions are polarised and that the best an author can hope for is a small, often temporary shift in audience identities.

Fairclough, formative in respect of developing *critical* discourse analysis (CDA) in the critical realist tradition (Fairclough, 1998; 2003), combines insights from Williams on the irreducible element of textual semiosis in all aspects of social reality, with the ideological concerns of Foucault's discourse analysis and Hall's insights on representation. A text, in Fairclough's (1992: 3) view, is

> *[a]ny product whether written or spoken, so that the transcript of an interview or a conversation, for example, would be called a 'text', [But] it is quite appropriate to extend the notion of discourse to cover other symbolic forces such as visual images, and texts which are combinations of words and images.*

Furthermore, Fairclough & Fairclough (2012: 465) see texts as historical moments and

identifies those texts important for critical discourse analysis research, as more than:

> *just representations and imaginaries; to having transformative effects on social reality, being operationalised – enacted as new ways of (inter)acting, inculcated in new ways of being (identities), materialized in new instruments and techniques of production or ways of organizing space.*

Similarly, *Avatar* was conceived in the hope that its messages would shift audience perspectives and change attitudes. The analysis concentrates on identifying scenes in the film which show the use and reference to the cognitive sciences and their relationship to ideological discourse. Since Cameron makes claims to an artistic transformative agenda, it becomes crucial to understand the way attention is deployed. In this way, the research explains some of the assumptions behind the framing of this study (explicitly in its title), regarding *Avatar* as a process of colonisation through the appropriation of attention, technically and discursively; Cameron colonises[27] popular conceptions of neuroscience similarly to how he colonises anthropology.[28]

The analysis therefore provides the insight that, for a commercial industry on the cusp of constant technological innovation, he models the medium in a powerfully immersive way, thereby (again) colonising it on a representational level. More detail of this part of the research is found in Chapter 3 which deals with the competition for attention required for an immersive experience of the film.

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[27] The term is used here in a loose way indicating broad actions of appropriating possession of a domain, but is also meant to reflect the study's concern with indigeneity.

[28] "In its use or misuse of anthropological methods, this film contains the desire of caging anthropology the way we are used to it being, preventing any possibility for it to change" (Madzoski, 2013).

The research data collection process included not only accessing the transcript of the film and digitised clips of pertinent aspects of *Avatar*, with its extra scenes (and its transmedia use) but includes interviews with Cameron where what he says about the production can similarly be captured and interrogated. These are a result of researching available online resources and from the extended collector's DVD edition of *Avatar*. No new interviews have been undertaken in this research. Regarding the method of interpretation of data, the use in this study of heterophenomenology requires the researcher to accept the spoken words of an actor at surface value but, as Daniel Dennett cautions:

> *exploiting linguistic communication in this way, you get a fine window into the subject's subjectivity but at the cost of a peculiar lapse in normal interpersonal relations. You reserve judgment about whether the subject's beliefs, as expressed in their communication, are true, or even well-grounded, but then you treat them as constitutive of that subject's subjectivity. To put it fancifully, suppose you burst into my heterophenomenology lab to warn me that the building is on fire. I don't leap to my feet and head for the door; I write down 'subject S believes the building is on fire'. 'No, really, it's on fire!' you insist, and I ask 'Would you like to expand on that? What is it like for you to think the building is on fire?' and so forth. In one way I am taking you as seriously as you could ever hope to be taken, but in another way I am not. I am not assuming that you are right in what you tell me, but just that that is what you do believe* (Dennett, 2003: 23).

There is a tension then between what Dennett calls "first person" and "second person" science in terms of what one might call "authenticity", but this is a tension I, as a researcher, am prepared to tread, since

> *[i]t has always been good practice for scientists to put themselves in their own*

experimental apparatus as informal subjects, to confirm their hunches about what it feels like, and to check for any overlooked or underestimated features of the circumstances that could interfere with their interpretations of their experiments. But scientists have always recognized the need to confirm the insights they have gained from introspection by conducting properly controlled experiments with naive subjects. As long as this obligation is met, whatever insights one may garner from 'first-person' investigations fall happily into place in 'third-person' heterophenomenology (Dennett, 2003: 23).

Before turning our attention to the mechanics of consciousness, this section highlights the point that a systematic approach to the mechanics of narrative involves an interplay with universal species-enacted cognition and historical discursive specificity, with culture being the preeminent category for that specificity. A systematic approach to a narratival approach to the analysis of texts likewise mitigates against inherent subjectivities in all[29] meaning-making but, rather than achieving objectivity, it corroborates evidence in support of particular discourses. The onus thus falls in the success of a multi-disciplinary corroboration[30] of the explanatory power of its analysis.

2.3 Cognitive attention schema theory: Mechanics of consciousness

One of the key insights from cognitive science, in its firmly established contribution to the epistemologies of the arts, social sciences and humanities, is that the processes around the construction of the self or the mind/body binary are adapted by the evolutionary biology of our species (Boyd, 2009; Krajewska, 2014; Kurzweil, 2005; Stone-Blackburn, 1993). As

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[29] i.e., consumer and analyst consumption of artefacts.

[30] More accurately, "synthesis".

these constructions are articulated (in the sense used by Hall [1996])[31] in cultural practice, the construction of the self is now quantifiable to a much greater extent, in the sense of reproducible, formal, scientific (often medical) and mathematical criteria. Advances in neuroscience (Graziano, 2013; 2016) and cognitive analytic psychology show, for example, that the nature of the self can be described mechanistically as an "awareness" (Graziano, 2013; 2016) of the brain's own functioning, specifically in the process of being aware of our subjective states of attention. This process of being aware of our attention is strung into a semblance of personal identity for purely strategic reasons, which is to say as evolutionary survival-oriented functions, stored in our memory. The attention schema theory starts (and ends) with evolution:

> *In this theory, consciousness emerged first with a specific function related to the control of attention and continues to evolve and expand its cognitive role* (Graziano, 2013: ii).

Briefly taking a very broad philosophic view, traditionally, consciousness has been a mystery, and nothing indicates the actual state of our evolution as a species more than this fundamental lack of conscious insight. The converse applies; if we are to survive as a species, knowledge of the workings of consciousness is imperative. But, as Krajewska cautions, alluding to the elusive nature of knowing consciousness:

> *The problem is that most of the 'knowledge' about consciousness (and there are*

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[31] "Articulation was always used by Hall in a double sense – referring, on the one hand, to expressing or giving voice while, on the other, to making connections (like the cab and trailer of an articulated lorry). Although cultural studies (and the critics of cultural studies) have tended to focus attention on the first of these – the ideological, discursive, symbolic practices of articulation – Hall never forgot that hegemony was also the site of the second type of articulatory work." (John Clarke, 2014. Focaal—Journal of Global and Historical Anthropology 70, 2014; 119).

thousands of publications on this subject) is mostly speculation with better or worse

arguments put forth by some scientists/thinkers. [32]

Thus far, humanity has only obliquely been able to grasp at this knowledge through ritual, speculation and science, the latter being considerably assisted by medical observation and correlation. This is not to say that consciousness is fundamentally unknowable; it is to counter the sometimes-extraordinary claims made by early thinkers, based on the very human feeling of needing cognitive certainty. But, as Michael Gazzaniga chronicles in his "eyebrow wiggling" style,[33] consciousness is subject to evolution that he traces over the last 2,500 years. My own attempt will not be remotely as exhaustive. It attempts merely to place neuroscience in a philosophical context, taking up ideas important to this analysis' interest in cognitive cultural studies.

Taking a neuroscientific view of history, and including philosophers in that framing, Gazzaniga posits a Western development track that starts with ancient Egyptians and Mesopotamians with an assumed sort of unified single consciousness, where people thought of the natural world in the same terms as Gazzaniga (2018: 13) thought of "himself and other men [sic]. The natural world had thoughts, desires, and emotions, just like humans". Gazzaniga makes the further assumption therefore that the consciousness of humans and nature were inseparable and did not have to be understood in cognitively different ways (Gazzaniga, 2018).

Moving from this assumption of a unified single consciousness in prehistory to the Greeks'

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[32] Personal email Fri, 31 May, 10:59, 2019

[33] See Gazzaniga's (2018:68) meaning of "*eyebrow wiggling*" and the anecdotal literary style his writing assumes.

advance in consciousness as differentiating and dissecting an outside separate, physical world, Gazzaniga isolates one devastatingly destructive cognitive pattern that continues to this day, taking its toll on our understanding of biology and the nature of the rational mind specifically, and is worth referencing here to unpack the complexity of the paradox he is referring to:

> *The scientific method as practiced today is a formal system in which a hypothesis produces its inferences, that is, its effects: the hypothesis entails its effects. Another way to say this is that the cause comes before the effect. This presents a problem when asking Aristotle's final-causation 'why' question. Let's go back to 'Why the cart, Aristotle?' Why did Aristotle have a cart parked in front of his home when hours earlier it had been parked at Acropolis Depot? He had seen the cart (which entailed the effects of the material, formal, and efficient causes) and wanted it. Here, the tables were turned and the effect came before the cause. This is a no-no in the Newtonian world, where a state can only entail subsequent states. Thus, Aristotle's final causation, as a separate category, was lost to science* (Gazzaniga, 2018: 15-16).

For this study, the fact that a mind is conceived as logically unable to set in motion its own volition and self-reflection, and therefore its own understanding of itself, has had profound implications for the evolution of the theory of mind processes. The linear conception of brain states as resulting from causes rather than the understanding that effects can also set cognitive action in motion was compounded by Descartes. This has splintered philosophy into forms of Cartesian dualism that bedevil us still today:

> *On the road to the present, Descartes boldly separated the immortal soul (and, with it, the mind) from the mechanistic universe and mechanistic body. With the mind and flesh considered separate, the mind became the central puzzle; it was deemed*

immaterial, indubitable, infallible, and immutable. By promoting the mind to supernatural status, Descartes took it off the table as an object of scientific study. Descartes could never explain how this immaterial mind interacted with the material body, but his theory profoundly gummed up the thinking about the physical reality of the mind for more than two hundred years (Gazzaniga, 2018: 27-28).

Gazzaniga turns to the British for his next stage in the history of consciousness, where philosophers were often physicists (and children of religion)[34] who made considerable advances in the dissection of the body and developed a complementary cognitive strategy – that of empiricism, a process started by the Greeks, institutionalised by Galen, abandoned by Descartes, fashioned into scientific inquiry by Locke,[35] and honed by Hume, leading eventually to Darwin's game-changing insights. Locke, says Gazzaniga (2018: 37) saw consciousness as "the glue that binds one's story together into one's sense of self, one's personal identity", a valuable insight in its pre-empting of theories of mental schemation. Locke believed that consciousness facilitates personal memory but while he agreed with Descartes that humans have free will, he resorted to metaphysics to explain how matter could produce mind.

Gazzaniga quotes Darwin, saying Darwin separated himself from the mind/body dualists when he wrote:

In the distant future I see open fields for far more important researches. Psychology

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[34] "The scientists were children of religion. Their new scientific knowledge of the world conflicted with their heartfelt childhood religious beliefs. They were experiencing what is now known as cognitive dissonance, the mental discomfort one feels when simultaneously holding two or more contradictory beliefs, ideas, or values. As a result, to reduce this discomfort, people try to explain or justify the conflict, or instead they actually change their beliefs" (Gazzaniga, 2018: 30).

[35] We will see later how this was an important idea for the growth of a narratival approach to psychology and a cognitive approach to cultural studies and literary criticism.

will be based on a new foundation, that of the necessary acquirement of each mental

power and capacity by gradation. Light will be thrown on the origin of man and his

history (Darwin, 1860: 424 cited in Gazzaniga, 2018).

Drawing on a trajectory between Freud who, says Gazzaniga, only has value for realising that most human cognitive processes are unconscious[36] and those German thinkers who strengthened the narratival conception of the self, Gazzaniga points to another moment of interest for this research:

> *Schopenhauer puts the intellect in the backseat. It isn't the driver of behavior and*
> *also isn't privy to the will's decisions; it's just an after-hours spokesperson, making*
> *up stories as it goes along to explain ex post facto what the will has wrought*
> (Gazzaniga, 2018: 46).[37]

The trajectory in understandings from Locke to Schopenhauer mirrors Gazzaniga's own conception of the mind as unconscious, non-linear, decentralised thinking likening it to a pot of bubbling water, each bubble having momentary existence, and each being replaced by stronger signals from the brain. Gazzaniga invites us to consider that consciousness may be understood "only as the brain's bubbles, each with its own hardware to close the gap, getting its moment" (Gazzaniga, 2018: 8).

Not surprisingly, Gazzaniga ends with his own state of knowledge of the field as a layered conception of consciousness. What is of interest in Gazzaniga's tale for this thesis, is its concern with rapid and emerging reconceptions of central human consciousness as multi-

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[36] "[Freud]'s original theories of psychopathology have not withstood close scrutiny and have generally been consigned to the trash bin" (Gazzaniga, 2018; 52).

[37] Schopenhauer also contributed the notion of "*Zeitgeist*" itself as a useful tool in later understandings of cultural studies and notions of hegemony, especially in the writings of Gramsci (Gramsci, 1971).

modal distributed awareness, suggesting an incremental historical process of understanding much more about the working of consciousness or, as I confine the term, attention.

Gazzaniga highlights the valuable contributions made by the medical contexts in which research took place and still does, and how this has formed and firmed up a more scientifically robust field(s). This research has led to some observational axioms in the literature around the conflux of symptoms, in turn, leading to some convincing conclusions. For example, Gazzaniga, speaking about his own clinical observations in pathology wards, described consciousness:

> *These patients with widely distributed brain lesions, a level of disruption vast enough to bring any computing machine to its knees, remain conscious. In one hospital room after another, each harboring a patient with a focal or a diffuse brain impairment, consciousness purrs along. After a tour of the wards, it begins to look like consciousness is not a system property at all. It is a property of local brain circuits* (Gazzaniga, 2018: 6).

In maintaining that the word "awareness" pertains similarly to the above example of consciousness, I move towards a position where consciousness ceases to have the specificity in meaning required to describe it rigorously. This slippage between the words denotes the unfixedness of the terms and their continuing mystery, but awareness can be qualitatively and quantitatively measured in different states at differing frequencies, whereas consciousness suggests a subjective, homogenous and therefore illusory "Cloud of Unknowing".[38] Michael Graziano echoes Gazzaniga in demonstrating the increasing obsolescence of the term,

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[38] This refers to the continuing religiosity which the notion of consciousness enjoys (https://www.catholicspiritualdirection.org/cloudunknowing.pdf).

"consciousness":

> *Since socially impaired people appear to be conscious and can report that they are conscious in much the same way that anyone else does, the evidence is against the theory that social capacity is the source of consciousness. The fundamental difficulty here is that the social theories of consciousness are too general. They imply that awareness arises from any and all social thinking. They predict a sweeping correlation between all social ability and awareness. The attention schema theory of consciousness avoids this difficulty because it does not suffer from overgenerality. It is much more specific. In it, awareness depends on one specific function, an ability to reconstruct, describe, or model the process of attention. It is not the 'social schema' theory but specifically the 'attention schema' theory. A person could be socially impaired in half a dozen ways and have no loss of awareness* (Graziano, 2013: 128-129).

But attention itself is not a homogenous process and there are some important disjunctures associated with different forms of awareness and what is often called "top-down" versus "bottom-up" impulses:

> *The 'neocortex' is the outermost region of the brain and the most recently developed in evolution. Roughly speaking, the subcortex has motivational and homeostatic functions (e.g., governing thirst). Thus, emotions such as anger are largely a function of subcortical regions. The neocortex is responsible for perception and motion, as well as the integration of information from different sense modalities. The isolation of emotional and information processing functions has fairly obvious importance for literature and the arts* (Hogan & Aldama, 2014: 294).

Although stimuli may arrive at the subcortical and neocortical areas of the brain almost

simultaneously, emotional processing appears to be faster than "the fuller perceptual processing" (Hogan & Aldama, 2014: 293) originating in the neocortical areas and may be mediated by those areas. For example, in 3D, a common film-making device is to seemingly throw filmic artefacts at the audience, via the depth of perception illusion that 3D consists of, to the extent that audiences involuntarily duck their heads. But the audience knows a split second later that it was just an illusion and is more prepared for that effect when it is repeated. In other words, neocortical processing may lead to mediation of the subcortical response. Likewise, it is conceivable that this may work in reverse too; the storyteller may use fear to surprise audiences out of their quiet reverie created by the ebb and flow of the story, in order to heighten emotional response and excitement. As Hogan (2014: 293) explains:

> *Task contradictions and complex interactions between neocortical and subcortical responses are pervasive in literary response. Understanding them should further our understanding of literary reception.*

Since brain (and other) cells may be either excitatory or inhibitory, neural circuits activate in sequence, likewise exciting or inhibiting neighbouring circuits. Again, this may have "significant consequences for our conception of mental operation in literary creation, representation, and response" (Hogan, 2014: 295). Practically, this has implications for how authors structure information in their texts, in the attention we are able to pay to the storyline, in the responses the story arc elicits, in the emotional response it produces and (in a film) the properly coordinated visual and auditory cues of the medium itself. As a result of these neurological dynamics, information is not static or fixed in the brain, being more of an ongoing and presumably multi-levelled competition for signal strength and durability. This

primary neurological mechanism forms a basic building block of neuroplasticity,[39] indicating a fluid process of experience that, in turn, seems to me to potentially provide some physiological basis for post-modern conceptions of meaning-making. Tangibly, an audience member may have made meaning of something in one instant (or over time) which is overturned in the next.[40] These mechanisms may be similarly implicated in ontological experiences of objectivity and subjectivity, but this ramification may be too broad to deal with in this study, beyond this note.

Laying the foundation to Graziano's (later) theoretical collapse of the popularly experienced self, the work of Ramachandran is worth articulating at length in the following anecdote on the challenges of unravelling consciousness:

> *The reason this is so hard to study is because it is inherently subjective. 'The first person singular does not exist in the physical world,' (Ramachandran) says. 'It's a ghost.' He calls this the 'vantage point problem'. People who experience such dramatic differences in perception may be rare, but we are all capable of distorting our sense of self. 'A simple experiment can show how. Try looking at yourself in a double-reflecting mirror – two mirrors facing each other such that the second reflects the image in the first. Then raise your right arm. The first reflection is a normal mirror image, but the second is inversed, which we are not used to seeing. So, when you raise your right hand, it raises its right hand. It's a doppelganger, miming your behaviour,' Ramachandran says. Keep looking and something odd can happen to*

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[39] First explored by Michael Merzenich who initially set out to prove that brain parts are discrete and functionally specified, the opposite of his findings on neuroplasticity (Merzenich & Jenkins, 1995).

[40] "(c)ognitive dissonance, the mental discomfort one feels when simultaneously holding two or more contradictory beliefs, ideas, or values. As a result, to reduce this discomfort, people try to explain or justify the conflict, or instead they actually change their beliefs." (Gazzaniga, 2018: 30). It is difficult to see how they could do so without neuroplasticity.

your sense of self. 'You start experiencing that you are out there.' What's more, if

you watch your arm moving in the second mirror, you may see a slight delay. As

Ramachandran puts it, it's slowed down as if your hand is moving through treacle.

Exactly why this happens is something he and his team are working on, but we know

that neurons in your brain telling your hand to move fire milliseconds before you

consciously decide to move it. To avoid the sensation of being a puppet, your brain

smoothes things out so that everything feels simultaneous.

Ramachandran suspects that when you see this doppelganger in the mirror, your

brain doesn't compute it as you – so the correction isn't applied. In essence, you are

seeing the unconscious machinery of the brain laid bare (De Lange, 2017).

Most theories of consciousness are magical, says Graziano, in two ways: how awareness

emerges from the brain is unexplained and how awareness controls the brain is unexplained:

This problem of double magic disappears if awareness is information. The brain is,

after all, an information-processing device. For an information-processing device to

report that it has inner, subjective experience, it must contain within it information

to that effect. The cognitive machinery can then access that information, read it,

summarize it linguistically, and provide a verbal report to the outside world

(Graziano, 2013: 19).

Attention schema theory is almost shockingly mechanistic and even emotionally disturbing

for some. Because its main claim is an understanding of the working of human awareness, the

construction of which has direct bearing on meaning-making at the point of awareness, i.e. at

the point of consumption of a cultural artefact, this study takes it as central to understanding

Avatar audience response. Graziano acknowledges the personal discomfiture in this shift in

existential awareness accompanying this knowledge:

This approach is deeply unsatisfying – which does not argue against it. A theory does not need to be satisfying to be true. The approach is unsatisfying partly because it takes away some of the magic. It says, in effect, there is no subjective feeling inside, at least not quite as people have typically imagined it. Instead, there is a description of having a feeling and a computed certainty that the description is accurate and not merely a description. The brain, accessing that information, can then act in the ways that we know people to act – it can decide that it has a subjective feeling, and it can talk about the subjective feeling (Graziano, 2013: 20-21).

A theory of mind would appear to be a basic first block in reading the meaning-making of that mind, but understandings of this primary unit of consciousness have been elusive, especially in its empirical representations, and the purvey only of weighty philosophical attempts, for millennia:

Because we normally acquire theory of mind so effortlessly, we cease to notice anything to master. We assume that we simply see situations as they are (Boyd, 2009: 143).

In other words, habituation and internalisation of those learning dynamics involved in the ordinary, day-to-day upkeep of the theory of mind[41] processes over time, are done automatically. Specifically, the mental models underpinning our sense of self no longer demand conscious attention. Consequently, the attention required to question and revise long-standing mental models feels like a waste of energy. But, in the consumption of a cultural artefact,

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[41] Not in the sense of a theory of how the mind works but the implicit process of attributing awareness to others and building mental models of their thoughts, feelings and future actions (Premack & Woodruff, 1978).

… mental states have implications for what processing traces are available in memory and how this information is used in reconstruction. Further, the mind supplements textual information with extra-textual input, and confuses what is in the text with what is not. Readers notice what is of interest or relevant to them, filter out what is not, and can draw unpredictable connections. In other words, we process literature in terms of how we interact with it. Each reader's interaction is selective. A serious endorsement of these limitations of the real reader's mind has extensive implications for the understanding of literary processing. Perhaps one of the most interesting is that aesthetic reaction is not to the text, but rather to readers' mental representation in memory, and that this mental representation bears a pale resemblance to the original. What is produced in the reader's mind can never, for any reader under any circumstances, be the equivalent of the text. Rather than bemoan this reality, as literary theorists might, we should instead recognize that it is that very outcome of the reading process – the mental representation – that makes literature memorable: Readers interact with the text, bringing themselves to it, so that the product of their processing is a unique combination of the objective and subjective, of the text and themselves (Bortolussi & Dixon, 2015: 46).

When it comes to cognitive analysis, Hogan outlines as a standard cognitive scientific method, the need to

… first define and examine our problem in terms of information processing. Second, we must articulate our analysis in terms of cognitive architecture only. Finally, we must develop our analyses as algorithmic sequences (Hogan, 2003: 31).

In other words, Hogan defines the problem here in terms of information processing. Since the "isolation of emotional and information processing functions" (Hogan, 2003: 31) cannot, in this study, be situated in a grand theory of consciousness, as Hogan attempts to do, this section

deals primarily with consciousness as awareness stemming from its information processing functions, leaving emotions for Chapter 2.4. But Hogan (2003: 30) notes that we need to formulate all our analyses, not only in terms of information processing, but also in terms of a well-specified cognitive architecture, made up of structures, contents and processes:

> *Structures are the general organizational principles of the mind. For example, the distinction between working memory and long-term memory is a structural distinction. Structures define the relations into which processes and contents can enter. Indeed, they allow processes and contents to exist at all. Contents are most often understood as representations or symbols. Thus my idea of a cat or my internal lexical entry for 'cat' is a mental content. Contents have specific locations in structures.*

The basic idea here is that any cognitive scientific analysis should consist of a set of steps that is fully explicit in moving from inputs of the (information processing) problem to outputs. This sequence of steps should reference only structures, processes and contents available within the cognitive architecture. Finally, each step should be derived from the preceding step by the application of some specified process of the cognitive architecture. Put differently, insofar as the cognitive architecture may be implemented on a computer, says Hogan, the solution to the problem should be a program (or simulation model) that would run on the computer and would produce the right outputs, given the relevant inputs (Hogan, 2003: 31).

The relevance of attention schema theory to the meaning-making of *Avatar* audiences is that it posits a process of mental model-construction, operating at many varied levels, in everyone. Meaning-making, in this sense, gives way to a larger, more explanatorily robust concept of model-building or, as Graziano (2011, 2015, 2017, 2019) terms it, mental schema. Henceforth, I will include the terms "schemating" and "schemation" for this process. I argue

that the formulations put forward by proponents of attention schema theory specifically (Graziano; 2017, Green; 2017), contribute to our understanding of meaning-making of a cultural product and the internal modelling that that process necessarily entails.

Consider the example of the schemation opportunities in this still from *Avatar*'s narrative. In one of the opening scenes of the film this still frame shows a recently disabled Jake Sully on a crowded urban street, on Earth:

Figure 1: Jake lost on crowded Earth street

Taking as a reference point the *meaning* presented visually in this still, I understand our protagonist to be part of a social circumstance increasingly typical of my own planet's future. Consequently, I have *identified* the visual meaning encoded in this frame. But, moving from knowledge of schemation, I understand that this frame triggers a process of interrogation or consolidation of my model of the future, and my subjective place in it.

Meaning, in this context, can disclose my feelings about those models of the future, whereas the method of starting with meaning-making indicates only the meaning embedded visually in the frame. Additional information is required to discover the emotional impact of the frame

to establish whether emotion is present at all, for example, in accompanying dialogue or preceding contextual frames.

Clip 33: Conditions on Earth

The ability of larger concepts to explain smaller, constituent processes is useful for more than weighing up theories; at stake here is the explanatory power offered by a model of the mind claiming a precise understanding of the self (Graziano, 2013), surely the most pressing issue in all interpretative sciences. But another way of looking at this process is through the lens of "chunking"[42] – conglomerating smaller pieces of information or data under constituent headings. A central concern in cognitive psychology, the idea that the brain chunks individual pieces of information together into a meaningful whole (Neath & Surprenant, 2003) has been extended to all levels of its cognitive schemation.

In 1936, Piaget developed a cognitive learning theory to account for people (via children) mentally processing the information we receive and doing so with differing forms of attention associated with different development stages. He named schemas as the basic building blocks

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[42] A term from cognitive psychology also now prevalent in computer science; one of many emerging syntactical cross-over concepts indicating the merging of cognitive and linguistic cultures.

of intelligent behaviour as:

(a) cohesive, repeatable action sequence possessing component actions that are tightly interconnected and governed by a core meaning (Piaget, 1952: 7).

Moving to a more self-reflexive mode of inquiry, knowing how the constant awareness of my attention results in the conclusion that I am an entity and that the unity, previously known as the self, is really an information-handling model that impacts directly on my mental point of view – I may not be the solid self I imagine and feel I know I am; I may be a far more flexible, self-programmable set of processes under constant construction. Knowing that others are similarly under construction becomes key to understanding more than just my own experience and allows an introspective reflection on the work others produce and its consumption by audiences.

As human attention is captured in newly immersive forms of media, such as 3D, VR and augmented reality (AR), the function of which draws increasingly on knowledge of the working and manipulation of the brain, so these technologies can be said[43] to colonise[44] audience experience,[45] to colonise attention, in an attempt to influence awareness and the cognitive content of that awareness. By providing stereotypical narratives, an alignment between mainstream social discourse and values is reinforced in *Avatar* since the constant bottom-up bombarding stimuli combination of 3D, fantastical scenery and mind-blowing

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[43] This insight is nothing particular to audience studies however, I am referring here to the extensive critical tradition in general, grounded in forms of Marxist and historical materialist analysis.

[44] See, for example, Donna Haraway (1991): "Modern production seems like a dream of cyborg colonization work, a dream that makes the nightmare of Taylorism seem idyllic. And modern war is a cyborg orgy, coded by C3I, command-control-communication-intelligence, an $84 billion item in 1984's US defense budget."

[45] "In efforts to colonise the electronic frontier the material body is repressed and divorced from the locus of knowledge … the body, as a sense apparatus, is nothing more than excess baggage for the cyberspace traveler" (Balsamo, 1996: 125).

potential human rewards bound up in those sorts of scenarios in the film, compete for the attention left for a critical top-down understanding of the issues, if there are indeed issues. And *Avatar* abounds with issues. Arguably, the sum of which is the issue of our survival as a species, where Cameron subscribes to the general view of the Anthropocene as a final, cataclysmic epoch in human civilization.

This is not an argument against using powerfully immersive technologies – it is evidence towards employing a more sophisticated, cognitively informed approach to mental schemation in the conception and analysis of cultural artefacts, to provide transformative capacity to narratives that take, as their rationale and value, the development of human consciousness. This process, I argue, is greatly enhanced by understanding the role of attention schema in meaning-making.

We ascribe attention to other beings (and even to inanimate and imaginary objects) and, in so doing, imbue others with subjective experience. This begins the process of meaning-making.

Preferred, oppositional and negotiated meanings (Hall, 1973) as a function of schemation likewise indicate the specificity required to identify *Avatar*'s schemating points of engagement, by identifying the historically-based discourses at work in both audiences and the film. Cultural studies concerns itself with matters of ideology and the concept of "discourse" which lies at the root of cultural studies analysis is seen as the main social vehicle for the maintenance of power relations between elites and the rest of humanity (Foucault; 1972, 1983, Hall; 1973, 1977, 1980, 1983, 1996, 1997, 2001, Fairclough; 1992a, 1992b, 1995, 2001, 2003, 2014, and Van Dijk; 1995). But discourse cannot be seen as a homogenous phenomenon, given its underlying neurological processes and, in defining the role of beliefs and systems of belief in discourse, Hogan 2001) points to a "focalisation" of possibilities that

determine whether an audience (or population, class or group) acquiesces to a discourse or social system or not, since acquiescence is relative to what they perceive as in the realm of possibility or, put differently, relative to perceived alternatives:

> *To a great extent, dominant ideology (ideology that fosters consent to the status quo) is a matter of beliefs that conceal oppression – from the oppressors, the oppressed, and those who fall into neither or both categories – and deny the possibility of an alternative, nonoppressive society. In addition, consent is crucially dependent not only on what specific views are held to be true but also what views are considered to be possible, what claims might be considered as even potentially true. An ideology that fosters consent, in other words, operates both by encouraging positive beliefs and setting the terms of debate so as to exclude certain sets of possible beliefs from consideration or discussion* (Hogan, 2001: 59).

This sums up, in my opinion, the "American[46] way of life" as a conscious attempt to define and confine the political and social playing field to prevent significant dissent to the status quo.[47] But (keeping in mind neuroplasticity) the social engineering of dissent depends, not only on rejection of alternatives, it also relies on compounding acquiescence:

> *It is important to emphasise that these mistaken beliefs are not isolated but part of systems of beliefs that are mutually sustaining and "confirming." For example, common ideas about the Gulf War fit into a system of beliefs concerning U.S. foreign policy in general, past U.S. wars, and so forth* (Hogan, 2001: 60).

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[46] The usage of "American" is of course a prime example of this. An entire continent is collapsed in favour of a special case, the United States of America, diminishing the signification of all the other countries of South and Central America, and Canada, in that process.

[47] Besides McCarthyism in general, see this revealing document indicating the sophistication of CIA analysis on the effects of discourse: https://www.cia.gov/library/readingroom/docs/CIA-RDP86S00588R000300380001-5.PDF

In *Avatar*, the dynamic of defining the playing field expresses itself in many ways, all derived from oversimplification, illustrated especially by its reliance on utopianism. This is discussed more fully in section 2.3.

Applying cognitive insights to the word "discourse" enhances our understanding of how ideology is perpetuated by discourse. It becomes clear that ideological discourse follows the same sorts of cognitive processes as any other human mental activity: through prototypes, exempla, schemas and procedures:

> *Cognitive scientists have articulated a general cognitive architecture that is empirically well-supported and that provides subtle, flexible descriptive and explanatory principles. Within this architecture, there are, roughly, four sorts of cognitive contents: schemas, prototypes, exempla, and procedures. A tradition may be very loosely defined as some putatively distinctive overlapping of these contents* (Hogan, 2006: 255).

This applies then also to the analysis of cultural objects:

> *First, in a cognitive account, patterns across an auteur's work must be the product of cognitive architecture, specifically procedural schemas coordinated with the usual representational structures – that is, representational schemas, prototypes, and exempla* (Hogan, 2004: 77).

A prototype, according to cognitive psychology, may be understood as the "most standard" case of a certain broad category (Hogan, 2001: 97):

> *In sum, we have good reason to posit prototype approximation as a universal principle guiding aesthetic response (i.e., a feeling of beauty; response to art is*

clearly much broader than a response to beauty). What does this tell us about variability in taste? That variability is not likely to be random or unconstrained, since our prototypes are unlikely to diverge too massively. They will be constrained by averaging (which, again, enters into prototypes) and by certain broad tendencies, such as enhancement of difference from contrasting categories, such as male or female. (On the last point, in addition to the works cited earlier, see also Chatterjee's discussion of Ramachandran on 'peak shift' or the enhancement of response to distinguishing properties [Chatterjee 2014, pp. 45–47].) Nonetheless, as with nonhabitual pattern isolation, the principle predicts considerable difference in particular aesthetic responses. Here, too, the nature of the universal is such that it in effect requires at least some diversity in its particularization (Hogan, 2015: 118).

But prototyping is not the only cognitive content that we have to relate to critical discourse theory in particular and cultural studies in general. In this regard, I now turn to the role of exempla:

Exempla can operate to foster consent in a variety of ways. Indeed, they are particularly effective ideologically, for the same reason that they frequently override schemas: they are often highly salient and affectively charged. They are much more noticeable and much more likely to provoke some strong emotion – joy, anger, or fear (Hogan, 2001: 105).

In line with almost all cognitive processing, exempla operate unconsciously (Hogan, 2001: 108). An exemplum is the idea of something rather than the thing itself.[48] For exempla to exist and operate in human consciousness, they do not have to be valid, true, objective, falsifiable,

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[48] Although philosophically important, the scope of this study cannot allow for discussion on the nature of reality, whether its components are simulacra or not and whether there is a *de facto* collapse between a "thing" and its representation.

scientific or any other epithet. I assume, in this context, "exempla" in its phenomenological meaning.[49] Following from this, exempla apply to both fictional and non-fictional narratives, ideas or perceptions of various sorts:

> *... some may be based not on generalizations (that is, schemas and prototypes) but on specific instances. Indeed, when an object (such as another person) triggers an exemplum, so that the exemplum becomes particularly salient, it will most often override conceptualization in terms of schemas or prototypes* (Hogan, 2001: 105).

To sum up, this section has sketched some of the pertinent literature relating to the mechanics of attention through the lens of attention schema theory and broadly accepts that the construction of the self, or the mind/body binary, are adapted by the evolutionary biology of our species. The nature of the self can be described mechanistically as an awareness of the brain's own functioning.

The section looked briefly at the history of consciousness through some of the major shifts in philosophical thought over the last 3,000 years[50] on the mind and its relationship to the world, and its bedrock of reliance on metaphysics and imagination as fill-ins – basically historical place-holders for real knowledge of the brain. Using Gazzaniga's witty historical perspectives and personal experience, a trajectory was drawn of the journey to the reconceptions of central human consciousness as multimodal, distributed awareness.

Advances in science and brain technology, in particular, have advanced scientific knowledge

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[49] Similarly, the study cannot delve into different conceptions of phenomenology: critical, realistic, constitutive, hermeneutic, etc. I mean it here simply as an approach that concentrates on the study of consciousness and the objects of direct experience.

[50] Admittedly, only through a commentary of Gazzaniga's (2018) writing.

to the stage where the insights from these advances can be useful in something as abstract as film-analysis, even 3D-specific film analysis. This has been primarily the result of applying the framing of consciousness as information processing combined with the insight that human subjectivity, our awareness of ourselves as distinct and continuous, can be unpacked through analysing attention modelling and schemation, and that it is this schemation that considerably affects meaning-making.

These sorts of extremely immersive media technologies lead to a partial monopolising of attention during the act of consumption of the media product, to the extent that they can be said to have the inherent danger of colonising attention for the purposes of producing certain kinds of awareness. This heightens the importance of a cognitively informed approach to mental schemation in the conception and creation of cultural products in general. Applying cognitive knowledge to this process of meaning-making greatly capacitates cultural studies, especially in their deepening of critical discourse analysis beyond the purely cultural and historical, to the evolutionary.

I argue, therefore, that all the ideas synthesised thus far can be brought under the critical theoretical umbrella of cognitive cultural studies.

2.4 Indigeneity, identity and exclusion: Mechanics of empathy

In this section, I look at both academic and journalistic literature which may indicate understandings of how empathy works in constructing indigeneity through the mental schemas of identity and exclusion. To do so, it is necessary to start by conveying some understandings primarily from the clinical literature on empathy, since there is a strong

dialectical relationship between social consciousness[51] and the scientific knowledge that (at least partially) legitimates it. I am aware also that here I am making an implicit assumption that there are commonalities across the different circumstances in which human cognition plays out. Since the literature is complex and extensive, the lens through which I examine it is through a selected study (Denno, 2016: 399) which both collates the research but, more importantly, frames the study of empathy in its most urgent fashion – as a matter of life and death.

Moving from the basic assumption that human beings find it difficult to kill our own species, capital punishment researchers, Johnson, Hritz, Royer and Blume (2016), ask how justice systems enable capital punishment and how functionaries[52] overcome this revulsion in the execution of their tasks:

> *The answer lies with the fact that jurors are much less likely to empathize with a defendant whom they perceive as not being like them. This process of dehumanization is often pursued through explicit, time-tested strategies, such as comparing the defendant to a wild, crazed animal or casting him (and it is virtually always a 'he') as a psychopathic killer. Dehumanization also can be pursued implicitly by contrasting the value of a defendant's life with that of the victim. No matter how it is accomplished, dehumanizing a defendant helps to overcome a juror's human inhibition against taking another person's life.*
>
> *Conversely, lawyers for a defendant facing the ultimate punishment generally see their task as humanizing their client. Defence lawyers believe that if jurors can*

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[51] And in this context, the cultural artefacts it produces.

[52] In this case, jurors.

identify with the defendant, imagine his 'walk in life,' or 'see the world through his

eyes,' they are less likely to choose the death penalty (Johnson et al., 2016).

The aims of the above research in exploring empathy are therefore similar to some of those in this research on *Avatar* audience cognition. Firstly, it is to identify individual culpability in the execution of justice (or in the production of artefacts seeking to change social attitudes and values) versus the possibility that emotional universals reduce that individual responsibility in the face of damaging social, experiential and material reasons for transgressions.[53] The second aim appears to identify the empathic requirements of persuasion (for and against capital punishment or intended filmic meaning-making outcomes). In the first case, both jurors and audiences face the same cognitive challenge, leading to the same deficit in judgment, by "systematically discounting the important social, historical, and situational determinants of behavior … and correspondingly exaggerating the causal role of dispositional or individual characteristics" (Lynch & Haney, 2011: 573, 590). Although neuroscience has cast some light on the basic philosophical binary of nature vs. nurture forces in the construction of individual responsibility, there is a long way to go to answering these fundamentals.[54] For example, neuroimaging cannot yet distinguish between sympathetic and affective brain responses (Johnson et al., 2016: 578). The second aim, to examine the methods of persuasion in making meaning in the courtroom, echoes the task required of both the maker of a film and the film's analysts.

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[53] Providing for mitigating evidence in the case of the law and similarly providing empathic argument for an author's point of view in filmmaking.

[54] For example, see Oxenham (2016): "It's another blow for neuroscience. The discovery of major software flaws could render thousands of fMRI brain studies inaccurate."

The question one has to insist on is: if another's life is at the mercy of juror ignorance around the motivation of his/her crime, how much more can an individual be excused for misunderstanding a film's intended meaning or an artist failing to fulfil the social expectations of his/her peers, critics or markets?

Most research indicates that, although sympathy involves feeling sadness for another person, empathy involves sharing another person's emotions. But a distinction can be made that empathy results from two different neural processes: "(1) an effortful cognitive attempt to take on another person's perspective (i.e., understanding another's feelings) and (2) an affective response to another person's emotions (i.e., sharing another's feelings)" (Johnson et al., 2016: 579). Further distinctions are necessary. Reflecting mirror neuron theory, the consensus amongst researchers is that the cognitive component of empathy is associated with increased activity in the frontal and parietal cortices that include networks associated with understanding what others are thinking based on their behaviour. Paradoxically, this has led to the insight that the affective component of empathy includes one's own representations of behaviour and that "perception of a given behaviour in another individual can automatically activate one's own representations of that behaviour" (Johnson et al., 2016: 578). Even at this level of analysis, the binary of emotion vs. rationality/problem-solving starts to break down in the face of mental schemation,[55] which is inclusive of both emotional and rational/problem-solving mental processes, at the very least, and shows promise in refining a more complete picture of cognition – to include an "affective response to another person's emotions and a cognitive ability to adapt to the other person's perspective" (Johnson et al., 2016: 575-6).

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[55] As does the nonsensical binary of emotional vs. cognitive, since I argue cognition includes many simultaneous processes across many brain regions.

The Johnson et al. (2016) research team, not surprisingly, therefore found that identifying another person as being in the same category[56] as oneself contributes to a feeling of similarity, which increases empathy and, of course, its corollary that outsiders are dehumanised:

Observations of neural activity reveal a disturbing fact: people respond more strongly to the pain of same-race individuals than to the pain of different-race individuals. Specifically, neurological mirror systems are less responsive when viewing people of another race in pain, thus causing individuals to experience decreased sharing of the emotional components of pain in people of another race. Moreover, these disparities are correlated with implicit bias levels – participants with greater implicit bias are even less affected when viewing physical suffering of other-race individuals than are participants with lower levels of implicit bias. One factor that may be driving this result is that implicit bias may impact the ability to recognise emotions, like sadness and anger, in out-group members. For example, individuals with higher levels of implicit bias are quicker to perceive anger in black faces compared to white faces (Johnson et al., 2016: 584).

Elaborating the effects of these implicit biases on the emotions of jurors, Johnson et al.'s (2016) research indicates that "people behave toward others according to their perceived level of warmth and competence".[57]

If someone is perceived as high competence and high warmth, others view them with pride. Envy is associated with high competence and low warmth, and pity is associated with low competence and high warmth. If someone is perceived to be low in both warmth and

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[56] Related research shows that category can be as arbitrarily defined as a temporary division in a game or an experiment.

[57] Čehajić, Brown & González (2009: 715, 716–17).

competence, others will be disgusted by them. Disgust is the only emotion which results[58] in the dehumanisation of the target and often occurs when the target is an outgroup member. The social cognition brain network is activated at a reduced level when participants feel disgust toward one another (Johnson et al., 2016: 586).

Dehumanisation may also happen to justify participation in immoral or violent behaviour, to justify past wrongdoing, or "avoid the emotional exhaustion[59] associated with helping another" (Johnson et al., 2016: 589). This last point, common-sense-based as it is (or perhaps because of it), is surprisingly missing from the literature on narratival theory and again, finds expression in clinical contexts (Vaes & Muratore, 2013: 185). Johnson et al.'s (2016) research indicates that, when helping others is costly (in either cognitive load or emotional responsibility and more likely both),[60] individuals have decreased motivation to empathise. The researchers' finding that there is choice involved in the capacity for empathy and the propensity to allow the experience and expression of it[61].

In other words, where ability and propensity are distinguished (Keysers & Gazzola, 2014: 163), this lack of expression reflects the fact that "empathy is not automatic but depends on attention and motivation" (Johnson et al., 2016: 582).

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[58] There is an assumption here that emotions are the result of dehumanisation, and not the other way around, and this linearity is presumably unintended, but certainly unexamined.

[59] Referred to as the compassion-hostility paradox (De Dreu et al., 2010: 1408-1411).

[60] Although the clinical research does not frame it as such, this choice possibly includes material costs to the empathiser.

[61] See also the research on empathy in human babies' responses, where fMRI scans suggest even pre-verbal children have involuntary and automatic physical empathic responses to those around them and have clearly not learnt these. However, in a study of older children a total of 55 boys aged 10 to 16 were assessed. Of these, 37 met the criteria for children with 'conduct problems', (which can develop into psychopathy later), according to questionnaire answers provided by parents and teachers. (https://www.dailymail.co.uk/sciencetech/article-2318442/Brain-scans-identify-psychopaths-childhood-empathy-seeing-people-pain.html)

It also suggests therefore that psychopaths find those forms of expression costly, arguably too costly to bear given the experienced ontologies[62] of their pathologies.[63]

There appears then, to be evidence that racist prototyping is subject to pattern recognition-driven cognitive chunking of similar facial features in sets, by habit, leading to stereotyping.[64] However, sensitisation to differences through mitigating experience (in the case of *Avatar*, visually and possibly emotionally) can encourage the remodelling of those stereotypes and an acceptance of racial differences. In other words, neural habituation and learning processes can either facilitate stereotyping schemation or they can prevent and even change it.

The Johnson et al. (2016) research team concludes that the "neuroscience of empathy provides one more reason to believe that the decision to sentence another human being to death is inevitably an arbitrary one, and one that cannot be divorced from either race or caprice" (Johnson et al., 2016: 598) but, in an analysis of *Avatar* (where disembodied/embodied immersion is an added factor in empathically-driven audience persuasion), it is necessary to delve into the literature directed more to the mechanisms of social cognition, specifically those coming out of research on the brain's multi-sensory spatial mechanisms of the bodily self and social cognition.

It is necessary to sketch some of the insights coming out of multi-sensory spatial theory, since it is in the ways empathy intersects with mental schemation of the self and models of the body in its relative space in the environment, that form part of cognition. Again, I choose to precis

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[62] Which is to say, the level of victimship in their own (often early) experience.

[63] This, in turn, implicates social processes in the creation of that psychopathy and therefore decreased criminal culpability in the eyes of the law since, when "ability and propensity are distinguished, one interesting result is that individuals who are diagnosed with psychopathy (and juveniles diagnosed with a conduct disorder) have high ability to emphasize but low propensity to empathize" (Johnson et al., 2016: 582).

[64] If facilitated by contextual factors such as cultural discourse and material societal relations.

this knowledge through a relevant theoretical study – one which builds theoretical bridges between research on cognition and that of empathy.

In pursuing Gallese and Cuccio's proposal that embodied simulation[65] is the primary brain mechanism underlying "the pre-reflective aspects of social cognition and the bodily self" (Gallese & Cuccio, 2015). Christian Pfeiffer compares embodied simulation theory to attention schema theory, according to which

> *we pre-reflectively empathize with others by predicting their current state of attention which involves predicting the spatial focus of attention. Thereby we derive a representational model of their state of mind. On this account, spatial coding of attention, rather than motor resonance, is the primary mechanism underlying social cognition* (Pfeiffer, 2015).

Relevant for this study's focus on viewership is Pfeiffer's observation that, because fMRI scans show that brain networks underlying social cognition and the bodily self largely overlap,[66] this indicates that specific functional associations exist (a) between motor resonance and body ownership/agency and (b) between multisensory spatial coding and self-

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[65] ES (Embodied simulation theory) proposes that, based on mirror neurons, the brain maps observed actions into an action space, into motor potentialities, within our hierarchically-organised motor system and thereby infers and predicts the action goals of the individual. In this way, it penetrates the state of mind of the other and thus links self and other in a pre-reflective empathetical fashion. I would like to point out that motor resonance, i.e., the mapping of observed actions into motor potentialities, necessarily depends on multisensory spatial coding. I argue that this is the case because of five points: First, the brain has access to the physical world only through the different sensory receptors of the body that bombard it with exteroceptive (e.g., vision, audition), proprioceptive (somatosensory, vestibular), and interoceptive (somatosensory, visceral) signals. Second, these multisensory signals must be integrated according to their spatial and temporal parameters (Stein & Stanford 2008) to inform neural representations of the states of the body and of the world around us – including the agents whose actions are subject to motor resonance. Third, the observed movements of these agents are coded in coordinates distinct from the egocentric spatial frame of reference upon which our motor system operates. Fourth, the brain must necessarily perform spatial transformations of the observed movements by the other agent into the egocentric frame of reference upon which motor resonance can operate. In sum, multisensory spatial coding is a prerequisite of motor resonance (Pfeiffer, 2015: 3).

[66] see Blanken, 2012; Ehrsson 2012; Jeannerod, 2003; Metzinger, 2003.

location/the first-person perspective (Pfeiffer, 2015: 5). This includes the role of the gaze[67] in social cognition and in making meaning of others' awareness through their state[68] of attention and therefore their state of mind, emotions and intentions (Beck & Kastner, 2009; Desimone & Duncan, 1995 in Pfeiffer, 2015: 4) by locating the whereabouts of others in the environment, through our vision and audio spatialisation. Although I cannot divert to discuss the neuroscientific literature on temporal mapping in the brain, it is becoming clear that the human concept of time is similarly modelled and that, in Piaget's terms, "time is a cognitive construct, a deductive scheme, not an intuition or form of sensibility"[69] (Piaget, 1957: 54 cited in Sauer, 2014: 4).

The implications of the cognitive ontology of time have been touched on here since there appear to me to be parallel (which is to say analogous) elements between, on one hand, the cognitive schemation referred to in these theories and, on the other, ideas around chronotopes (Bakhtin, 1975), somatopes (Fernandez, 2014), Haraway's treatise on the cyborg (1989) and the (specific) historicity of critical discourse studies and cultural studies. To incorporate into the same conversation concepts across the divides of physiological[70] knowledge of the body and theories around narratival structure and function is highly epistemologically problematic but I will nevertheless attempt a synthesis, albeit it in a spirit of experimentation. To do this, it is necessary to open a parallel conversation on the nature of time and space.[71] This may consequently reflect how time/space schemations become part of the cognitive processes

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[67] Established as a directiveness of attention, through sight, sound, touch, gravity, etc (Ionta et al. 2011; Pfeiffer, 2015: 9).

[68] And directedness.

[69] Which is to say an objective phenomenon to perceive and track.

[70] Clinical in the sense of biological knowledge derived from medical observation and experimentation.

[71] The treatment of this topic is by necessity superficial and is done anecdotally.

involved in meaning-making in the production, consumption and critique of cultural artefacts. This will inform an analysis of *Avatar* and assist in introducing some understandings of the deployment of empathy in the film, the social cognition mechanisms through which the film is understood and the universal biologies which capacitate mammalian attention and human self-awareness.

I start this exploration with a discussion of time and of space to explore the effects of these concepts on the exercise of awareness and attention in human social cognition, and the narratives we form into stories about ourselves. I do this on the presumption that the erroneous imaginaries of time and space in science and popular global cultural and linguistic discourse, reflecting a (relative) subjective experience of these concepts, have been conceptual place-holders for a purely human conception of both scientific viewpoints and popular personal experience.[72] In other words, I propose that they are erroneous constructions standing in for real knowledge of these systems, that this is reflected in the cutting edge of academic and scientific debate, and that there are historical processes afoot to obsoletise both concepts, together with the prevailing underpinning presumptions of the universal centrality of human consciousness (in spite of abundant evidence to the contrary). It is in this vein that we return to a discussion of Bakhtin's chronotope (1988), Fernandez's somatope (2014) and possible extrapolations of these two, in the hope that, by deconstructing the illusions implicated above, we may cast light on how these metaphors are constructed. In doing so, I further hope to uncover commonalities in the metaphors of time and space used in semiotic models in the affective sciences and those of the arts to, in turn, uncover cognitive commonalities between

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[72] It is hardly surprising that, whatever legitimacy scientific knowledge may claim, it is produced by a purely human consciousness and where other means are employed, those means (like mathematical computation) have similarly been fashioned along human semiosis. For example, there is no such thing as space, only matter, antimatter and energy, and the appearance and illusion of space based on a vague intuition about what is not in our visual field.

cultural artefacts and that of the cognitive schemation producing those artefacts, and the resulting implications for a study of *Avatar*.

Bakhtin's concept of the chronotope[73] is an attempt to lay out the structural cognitive field of the novel:[74]

> *We will give the name chronotope (literally, 'time space') to the intrinsic connectedness of temporal and spatial relationships that are artistically expressed in literature ... Time, as it were, thickens, takes on flesh, becomes artistically visible; likewise, space becomes charged and responsive to the movements of time, plot and history* (Bakhtin, 1988: 84 cited in Fernandez, 2014: 1122).

Described as a "temporally articulated space or a spatially articulated tempo" (Fernandez, 2014: 1122), chronotopes can be conceived as definitive in genre and generic distinctions and function as "the primary means for materializing time in space, emerg(ing) as a center for concretizing representation, as a force giving body to the entire novel" (Bakhtin, 1984: 251 cited in Fernandez, 2014: 1123). As Fernandez explains, "The chronotope packs a set of signifiers into very little discursive space by drawing on a subconscious set of signs, which automatically concatenate into an identifiable scene and predict a plot sequence; *a semiosis is activated*"[75] (Fernandez, 2014: 1123). However, Fernandez (drawing on Haraway, 1985) makes a further extrapolation of chronotope as somatope. She asserts that representations of the body are increasingly central to contemporary narrative and that the importance of this chronotope "virtually demands its naming":

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[73] chrono referring to time, and tope referring to space.

[74] which I can project to other media forms.

[75] My emphasis

We take 'soma,' to signify 'the body of an organism,' and, 'tope,' to signify 'place.'
Hence, the body place names the somatope. In practice, the somatope carries the
weight of the obsessions of its narrative. The somatope encodes a host of meanings
penetrating and surrounding the image of the body. The somatope and its feverish
references bind all the seemingly unrelated phenomena within the text together (...).
In somatopic narratives, the body is the site that makes meaning and directs the plot.
For what happens to the bodies in a somatopic text determines the plot. And bodies
in somatopic texts are almost always morphing or under contention. The image of
the body is at dead center of the narrative. The body is the fulcrum of the narrative,
and the narrative is enslaved to its representations of the body (Fernandez, 2014:
1124).

But far from negating time as a definitive category, Fernandez's focus includes it in her reconceptualisation of the chronotype since "[a]n alternate term might be the chronosomatope or even the somachronotope but that seems unnecessarily weighty for an already weighty theoretical term" (Fernandez, 2014: 1136). Therefore, with the inclusion of the framing of the Haraway's cyborg analogy (1985), a chronosomatope sketches the cognitive landscape of cultural production through the triangulation of time (with its constituents of linear chronology, sequence recognition, velocity, etc.). It also does so through the body (with its sensory motor, body and memory schemas, its empathy neurology, its biological universalism and its confinement of the self) and the spatial relationships that mental schemas maintain in respect of the body, the body's environment and its subjective so-called, inner-space:

The cyborg appears in myth precisely where the boundary between human and
animal is transgressed. Far from signaling a walling off of people from other living
beings, cyborgs signal disturbingly and pleasurably tight coupling (151)

Haraway, approaching the problem of exclusion and subjugation from the (Foucauldian) point of view of the power wielded over (women's) bodies, and additionally, as a critical theorist consciously playing a "blasphemous" role in her militancy to breach epistemological boundaries, has the following pertinent synthesis; "I am making an argument for the cyborg as a fiction mapping our social and bodily reality" (Haraway, 1991: 150). It could well be that this mapping reflects and is enabled by similar processes underpinning all cognitive activities and that their subjective experiences appear to resemble a similar pattern of attention schemation and a similar spatial and temporal semiotic process of chunking information into constituent categories, as placeholders for too much detail, as that which occurs in the brain's physiology. What this insight could lead to is a discussion of pattern recognition in general but, for my purposes here, I use it as an introduction to discourses, which I see as mental schemations lying somewhere in the hypothetical space between a product, such as a novel, and the stories brains tell themselves about who we are, the one producing the other in a lifelong dialectical loop.

This dialectical relationship indicates the important links between how attention is culturally entrained and distributed in its global social articulations, the framing of its discourses and entrenching power dependencies, whilst using those same discursive formations to gain access to a wider audience through superficial empathic support.[76] In this sense, empathy has been commodified and has been significantly co-opted into hard-sell marketing and the expansion of a consumer base for global media.

Discourses are thus powerful conveyers of stereotypical[77] cognitive content. For example,

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[76] i.e. as in a film like *Avatar*

[77] Stereotypes being one of the less cognitive and emotional weighty ways to process social information.

paradoxically, *Avatar* has also been criticised as racist in the popular press. CBS News reported:

> *Robinne Lee, an actress in such recent films as 'Seven Pounds' and 'Hotel for Dogs,' said that 'Avatar' was 'beautiful' and that she understood the economic logic of casting a white lead if most of the audience is white. But she said the film, which so far has the second-highest worldwide box-office gross ever, still reminded her of Hollywood's 'Pocahontas' story – 'the Indian woman leads the white man into the wilderness, and he learns the way of the people and becomes the savior…. It's really upsetting in many ways,' said Lee, who is black with Jamaican and Chinese ancestry. 'It would be nice if we could save ourselves.'*[78]

But James Cameron counters this charge with his own interpretation:

> *'I don't buy that, I don't think that any of these indigenous people that see their reality in the film felt that at all'. He stressed that the reaction of the indigenous people has 'been overwhelmingly positive', and that the very survival of these people is at stake as these 'highly mechanized, industrialized force[s]' destroy their forests. Responding directly to the 'white messiah' critique he added, 'When all you've got to fight back with is bows and arrows, there has to be intervention from the international community. So I don't care what race the messiahs are, but we all have to be those messiahs, we have to help these people because you can't stop a bulldozer with a bow and arrow'* (Taylor, 2010).

Cameron added:

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[78] https://www.cbsnews.com/news/racist-theme-in-avatar/

… the film asks us to open our eyes and truly see others, respecting them even though they are different, in the hope that we may find a way to prevent conflict and live more harmoniously on this world. I hardly think that is a racist message' (Singh, 2010).

That Cameron's critical myopia and lack of insight into how discourses critical of racism can themselves perpetuate racism is hardly surprising given the market demands his products serve – but there is a further paradox that is more difficult to understand. As Mayton (2010) frames the context of indigenous support for Cameron's film:

If Palestinians are dressing in blue and going to the streets in protest to show how connected they are to the fictional people of Pandora, does it not also reveal a stark reality that they would deny: a foreign saviour is needed if they are to realise their goal of throwing off the yoke of Israeli occupation?

In this context, a discourse critical of Western capitalism legitimates its subject, engraining a perspective that remains hidden behind the seemingly scathing critique. But *Avatar* shows up another ambiguity. As Bron Taylor points out:

(C)ritics including Deloria (1998), Churchill (1998), and Krech (1999) have argued that portraying Indians as ecological and countercultural heroes can be harmful to real Indians. Displacing them to another planet, however, may have the effect of providing audiences with an alternative, and more respectful, context in which to gain understanding about what being indigenous might mean (Taylor, 2010: 384).

Thus, factors, such as the shift in the context within which meaning is made of racial differences, allowing a certain disassociation with reality, may have different effects on audience identification, depending on other contextual factors.

2.5   Literature Review: Findings

The literature suggests that a process of convergence between culture and biology is well under way and this convergence is situated around adaptive behaviour and human cognition which play out historically, rendering "debates about the compatibility of the humanities and sciences … marginal when culture is revealed as having a biological centre" (Krajewska, 2014: 27). David Herman makes the link between these behaviours as "they manifest themselves in non-fictional as well as fictional narratives anchored in a variety of 'discourse domains', determining what sorts of ascriptive practices will be governed by norms that cut across the fiction/non-fiction distinction" (Herman, 2017: 196). This suggests commonalities across human cognition-implicated mental schemation, across most if not all forms of imagined semiotic forms, whether they are part of internal fictional or hypothesis-motivated modelling experience, or the factual world these constructions find material form in.

The point to be highlighted in this section is that a systematic approach to the mechanics of narrative involves an interplay between universal species-enacted cognition and historical discursive specificity, with culture being the preeminent category for that specificity. A systematic approach to a narratival analysis of texts likewise mitigates against inherent subjectivities in all[79] meaning-making but, rather than achieving objectivity, it corroborates evidence in support of particular discourses.

A brief sketch of Gazzaniga's view of the history of consciousness indicates the rift in

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[79] i.e., consumer and analyst consumption of artefacts.

Western philosophical thought caused by Cartesian dualism but, on the other hand, advances in understanding of the nature of consciousness as multi-modal distributed awareness[80] and an increasing obsolescence of the term "consciousness". An emerging conception of awareness as encompassing task contradictions and complex interactions between neocortical and subcortical responses are pervasive in literary responses and behoves the analyst to identify these top-down and bottom-up influences in texts. The conclusion of this section of the literature review is that an increasing acceptance and usage of attention schema theory is opening up how we understand the social cognition of communication between and within neural systems – as temporal/spatial/body relationship-modelling approximation under constant construction.

Following Fernandez's reformulation of Bakhtin's structural landscaping of the novel as constituted by something akin to chronosomatopes, modelled on the analogous coordinates of time, body and space in mental schemation, coupled to (culturally entrained) narratival and diegetic compulsions of semiosis, reveals possible opportunities to detail the particularities of discourses in terms of how they construct relationships between time, space and the bodies involved in those configurations. In that sense, discourses lie somewhere in the hypothetical space between a product, such as a novel, and the stories brains tell ourselves about who we are, the one producing the other in a lifelong dialectical loop.

Using the analogy of the jury, this chapter investigated literature on empathy, finding a strong correlation between identity and empathy resulting in the uncomfortable knowledge that empathy is implicated in assisting mental schemation in support of, and against, propagation

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[80] As opposed to a centralised "seat" of consciousness.

of stereotypes like racism, through its most basic articulation – inclusion and exclusion of perceived group membership.

Empathy results from two distinct neural processes: "(1) an effortful cognitive attempt to take on another person's perspective (i.e., understanding another's feelings) and (2) an affective response to another person's emotions (i.e., sharing another's feelings)" (Johnson et al., 2016: 579). The affective component of empathy includes one's own representations of behaviour and that "perception of a given behaviour in another individual can automatically activate one's own representations of that behaviour" (Johnson et al., 2016: 578). In any event, the effects of identity can be devastating on individuals and groups, leading to (if an effortful cognitive attempt to take on another person's perspective fails) cognitively dysfunctional social relations and the discourses propping them up.

There is the issue of the cognitive load represented by empathic engagement with semiotic representations of the other, the emotional and material costs of such engagement, and the reschemation of personal and cultural mental models to accommodate such shifts. But far from only preventing evolutionarily necessary changes in attitudes to outgroup stereotyping, this process is continual and porous even if, paradoxically, existing attitudes and models are defended vehemently, open to persuasion, change, reprioritisation and growth, albeit always to a greater or lesser extent, negotiated and partial. This has direct implications for other audiences (besides juries) since according inordinate importance to personal culpability and agency involves "systematically discounting the important social, historical, and situational determinants of behavior … and correspondingly exaggerating the causal role of dispositional or individual characteristics" (Lynch & Haney, 2011: 573). This appears to me to have bearing on how we ascribe attention and agency to the stakeholders in commercial communication events: audience, artist, critic and market.

CHAPTER 3 *AVATAR* AND ATTENTION SCHEMA

3.1 Introduction

Attention schema theory posits that our subjective experience of ourselves is the awareness of our state of attention. Part of that awareness is the attribution of an awareness like ours to other beings. This recognition is part of a to-and-fro of mental schema building, the results of which are mental models built on our own awareness of ourselves that build on our awareness of another's attention. Michael Graziano clarifies his use of the word, "*model*":

> *I mean something close to the colloquial term. I mean something reduced, simplified, and convenient, that represents something else more complicated, like a model airplane represents a real airplane, or a plastic soldier represents a real one. A model in the brain, in this use of the word, is an information set that is constructed and constantly updated by neuronal machinery and that represents something useful to monitor and predict (Graziano, 2013: 60).*

If attention and its awareness function as a survival strategy in our evolution, it may follow that the products of the application of attention and the acts of creativity deriving from the application of attention, may hold keys to understanding the motivation behind that creativity. The following section explores this possibility through the lens of attention schema theory.

3.2 Textual analysis: Attention schema

It may follow that our state of attention defines our susceptibility to attitudinal change and therefore, for Cameron to effect the changes he wants to achieve in his audiences' value systems, he needs to incrementally increase the pressure to shift perspectives over the course of the film's narrative. Those shifts needing to be introduced gradually to become accepted

and then habituated.

Consider the initial arrival and disembarking of the soldiers on Pandora, where Cameron employs an interesting shift in the point of view of the camera's attention, its framing and focus.[81] This allows us to explore the different ways the term *attention* is referred to in this work:

Clip 34: Mercenaries disembark with attention switch

The actor-soldiers' attention is understandably focused on their first impressions of the new planet. The hand-held camera, representing the viewer's point of view is included as one of the actors, lending a documentary feel as if the camera has been embedded on a facilities tour of enemy lines. This device breaks down the so-called "fourth wall" which traditionally separates the audiences' attention between what is intended for the viewer and what is intended only for the story characters. In breaking down this convention, Cameron is making a complicated (if undeveloped) statement on the power of the medium and audiences' own acquiescence to that power.

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[81] Put differently, Cameron draws a distinction between the attention of the characters within the film and the attention he draws of the viewers via narrative, scenes, tension between characters, technologies, etc.

The trope exploited in this shift in directorial attention is directly developed from images of conflict journalism, especially of journalists embedded in American forces in the middle east. This has the effect of lending credibility and excitement to the meaning made of this scene, as well as drawing the audience in emotionally. In accepting the shift in point of view, viewers accept brief membership of the soldier group, potentially allowing for an emotional, empathic and attitudinal negotiability in our own attention states and a concomitant empathy with Jake who is left behind. This, I would argue, provides for the possibility of attitudinal change leading to revisions of the mental models we normally employ to understand the world and our place in it, since we perceive others' positions in it more clearly (or even for the first time). Applied to the experience of audience readings of meaning in *Avatar*, I would assume that individual meaning-making includes a consideration of the meaning intended by the author, in this case, James Cameron. While a historical materialist analysis may be inclined to see Cameron as less an individual than a member of a class with the power of defining mainstream cultural discourse (so rendering individual authorial meaning-making spurious), attention schema theory provides insight into how authorial intent and the resulting intended meanings become negotiated in the theatre experience and through subsequent discursive social interactions.

Since meaning is made according to audiences' mental schemation, their negotiation of the director's intended meanings and their existing mental models becomes the area in which the director needs to work with both narratival and technical clarity. This is also a result of discursive involvement after the event – on one side of the continuum, e.g. fandom, and on the other, a political movement against showing the film. I briefly frame some of the tensions between audience response and what appears to have been intended by Cameron in the following clips. It begins with an example of how authorial intent plays a significant role in

audience response and how these scenes have been interpreted by different political groupings, in the following elaborate visual metaphor of the military/industrial/prison complex:
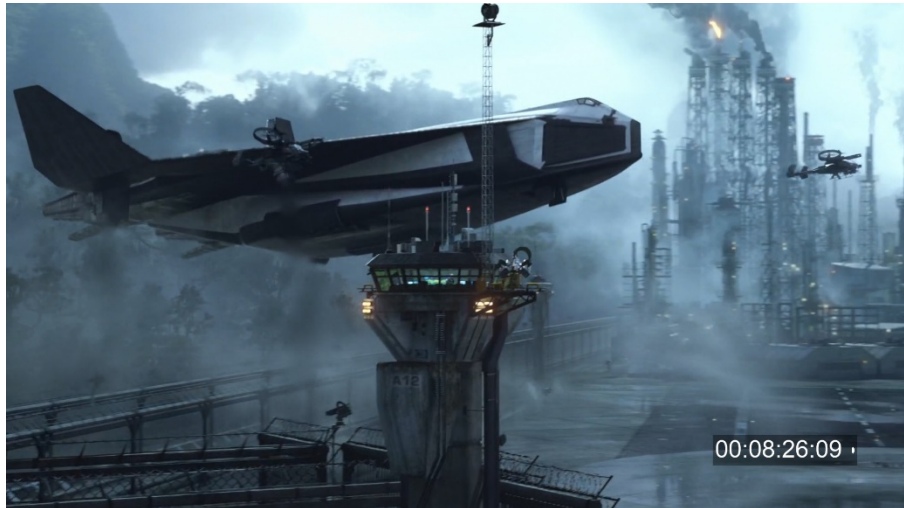
Clip 35: Spaceship lands at fortified refinery on Pandora

The conflux of military, industrial, prison fences and watchtower imagery is an overt visual metaphor which Cameron calls our attention to, as is the environmental pollution that results. But the viewers' attention is drawn to this metaphor on several sliding scales, dependent on their experience and knowledge of these dynamics in their own lives. This pertains for instance to the brutal aesthetic in the composition of the scene, with matching gunmetal blue-grey filters harmonizing colour with dramatic form, the balance of which I regard as very effectively achieved in the final illusion. But one person's aesthetic appreciation is another's horror, with extensions to hellish associations and a genuine concern for our planet's survival – yet others may simply admire the efficiency of the plant, and wonder what contract workers' rate of pay is, and so forth. Dialogue compounds the metaphor: "**Well, ladies**…**Look**

`at all this fresh meat, wooh!`"Reminiscent of the welcoming inmates reserve for new prisoners,[82] the coarseness and sneering sexual innuendo compounds Cameron's conflation of prison and military whilst commenting on the calibre and integrity of ex-military mercenaries, itself a growing multi-billion-dollar industry.

Clip 36: Male scorn and othering of new recruits

In a single set of filmic strokes, Cameron succeeds also in caricaturing another multi-billion-dollar industry, even more disturbing than the mercenary phenomenon: the privatised prison system in the US that serves as a model for global incarceration. He also continues the process of re-visualising the modern American male,[83] in an attempt to rebuild the hero as empathic and sensitive.

However, even such obvious metaphors may have an oppositional or negotiated meaning. Conservative and right-wing criticism of the film is revealing and shows consistent oppositional readings of the working of metaphor in popular fiction. In other forms this

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[82] Cameron may well have been directly referencing the following sort of fresh prisoner intake epitomised by this scene from Shawshank Redemption: https://youtu.be/mR8hHqDygYQ?t=67

[83] Albeit with an Australian actor.

criticism takes, oppositional readings come from rejecting the logical distinctions Cameron builds in the script and dialogue; they are simply rejected as qualifying variables. In this way, conservatives ignore these conceptual distinctions and proceed as if none were made or that they are irrelevant. In the next section, I explore a few examples of this a priori ideological filtering and positioning, which will illustrate this dynamic.

The value distinction between Marine and mercenary is well established in the following clip – although Jake Sully and his creator, James Cameron, honour the Marine Corps, they are hostile to mercenaries:

Clip 37: Male scorn ideological positioning

But as we will see shortly, the distinction between mercenary and Marine, which Cameron assumes, is contested by conservative commentators. Similarly, in the next two clips, Clips 38 and 39, corporate executive, Parker Selfridge, trumpets his racism in such unequivocal terms that many viewers would consider the obvious irony clumsy and over-stated. But, as we will see, even the most overblown metaphors and ironic references are taken at face value:
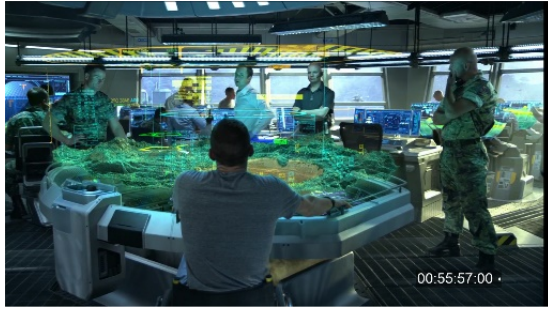
Clip 38: Parker's blue monkeys' racism

Clip 39: Dr Augustine confronts Parker

Selfridge's racist rant on the colour of the Na'vi's skin is echoed unselfconsciously by audiences who are, in fact, racist.

"This is the only time I ever sat in a theater where people were cheering the forest and the blue people attacking ex-Marines," says conservative activist Tom Roeser. James Balcer, decorated Marine veteran, agrees, "The film makes Marines look like lunatics. In reality," he said, "We are a good, generous country that helps people" (Auster, 2010).

> *Asked if the film is anti-American and anti-military, Balcer said, "Well, they never mentioned America but when you have the eagle, globe and anchor – the Marine Corps emblem – it has to be America." "And that's the Hollywood view of us," Roeser complained. "We are the exploiters, we are pre-emptive attackers"* (Auster, 2010).

The conflation of Marine, ex-Marine, mercenary and country, is concerning. The data were simply ignored by Roeser and Balcer in favour of crude chunking of input driven by prior emotional, attitudinal positioning. Similarly, ironically, my own perception of the Marines in the lobby of the Imax cinema was that they had the same dress code as the mercenaries in the

film. I am then also guilty of simplistic schema-building and I had just seen the film![84]

However, there would be very little chance that Cameron would not have intended the meaning drawn from conflating the dress of his actors with those of real Marines.

Cognitive processes take place, firstly, in a biological environment. But culture is intrinsic to cognition in the production and reception of cultural objects, as Krajewska (2014: 17) explains:

> *For instance, to make a film which correlates with our visual, perceptual, cognitive apparatus as human beings, the film maker has to take account of the way the human brain processes visual information through the analysis of certain cultural products. As a consequence, film relies on a running rate of twenty-four frames per second, an obvious example of how film makers have matched our biology to our own benefit in understanding the cultural object.*

Interestingly, Cameron works now exclusively at higher frame rates (in excess of 60 frames per second) for reasons both technical and aesthetic. Since 3D technologies are fundamentally optical illusions, the way attention is coordinated in viewers' perceptions to achieve the effect becomes crucial. Quite besides the areas of discursive contestation in meaning-making, the fluidity and perceptual integrity of the 3D medium itself requires considerable technical skill.

In that sense, the basis of future meaning-making is constructed on a very basic, physiological level. This section unpacks how attention is deployed in *Avatar* in order to discover the boundaries of species-specific, biologically based meaning-making and the meanings made at a cultural and discursive level, in this case, narratively. Consider the following scene from

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[84] After many viewings, my mental schemation of the film has grown, but the two dress codes still remain the same, fixed as a unity of ambiguity.

the film – multi-layered digital compositing techniques are designed to fuse discreet elements of a scene into a plausible whole, to be cognitively acceptable to human awareness reliant on pattern-recognition. In addition, the level of visual media literacy across global audiences is advancing, even if these understandings are unarticulated, unreflexive and differentially applied across classes and cultures:

Clip 40: Frame rates and resolutions

A practiced eye perceives the different frame and shutter rates, and differing resolutions in the visual content of the scene; the avatars move more fluidly than their human counterparts, the camera movement is different to those added composited elements and the end of Jake's tail is created with a very high framerate possible in the animation techniques used for its creation.

Technically, the animation and compositing techniques required for advanced 3D motion graphics demand higher frame rates and resolution to be cognitively plausible to audiences and to avoid the appearance of digital visual artefacts. When compositing media assets of differing resolutions, colour depth and frame rates into a multi-layered whole, the challenge is to overcome the tendency for human perception to continually compare information based

on pattern recognition, where the smallest discrepancies stand out. In that sense, Cameron is matching emerging technology to increased media literacy, but this is dialectically related – emerging technologies increase media literacy as cognitive processing of these technologies become habituated in individual brains and part of the social capital of audiences. The literacy of digital visual composition is built on original dramatic forms, developing techniques from previous craft practices. For example, the stage device of a front act curtain to introduce a scene (used here as a camera movement to "reveal" a change in scene), combined with "skinning" (graphic overlays on chroma-key surfaces) is designed to focus attention and build plausibility and is a major priority in *Avatar*'s construction. These next two clips illustrate this point:

| **Clip 41: Composite camera reveal** | **Clip 42: Composite camera reveal** |

In theorising Cameron's use of these technologies, applying Hogan's idea of "occlusive foregrounds" aptly describes Cameron's use of camera shots as a "complex of procedural and representational structures, prominently including a set of relevant prototypes" (Hogan, 2005: 77). This is where foreground elements in multi-layered digital visual composites play a significant role in creating *Avatar*'s sense of depth and hyper-reality that lends itself to capturing audience attention (amplified in 3D) by filmic devices such as pulling focus, which is an attempt to draw viewers into the practice of shifting their attention across more focal planes, outside their normal point of view. Cameron invests considerable attention in this particular meaning-making, since these techniques have the potential to construct

consciously-designed conceptual story worlds and to leverage changing attitudes around the vulnerability of audiences to new sensory experiences.

The device of self-death and rebirth is used extensively in *Avatar* as a filmic theme but also as a way of habituating viewers to the idea of awareness transfer to other beings – a metaphor for empathy. To do this, audiences need to, at least by proxy, experience and practice similar shifts in attention: how to focus it, how to deflect it, how to split and diffuse it. And this, arguably, for the growth of audience members' self-awareness. Scenes of awareness transfer show the research and attention to detail in *Avatar*'s visuals, and its commitment to provide a neurologically informed representation of attention states:

Clip 43: Jake's awareness transfer to his avatar body

The theme of consciousness transfer, at the conceptual heart of *Avatar*, analysed through the lens of attention schema theory, uncovers a basic fact: directing audience attention is the foundation of consuming a cultural object and that effort directly facilitates the success of the mental schemation affordances to audiences. In film, that task falls on the director, and James Cameron is indeed the author of his work and, in a real way, his budget. It follows that issues of where attention has been given to *Avatar'*s production budgets reflects the priorities of the author.

The application of attention schema theory reveals that Cameron spent less of his own creative attention on the discursive details of his storytelling and the meanings made from his story than his technical delivery of the medium. This is very clearly shown in the device of screen simulacra which are digitally superimposed semi-transparent visual layers composited to provide the appearance of digital display screens:

Clip 44: Simulacra composite   **Clip 45: Reflections within simulacra**

The simulacra within simulacra, within screen simulacra, within 3D, within the *Avatar* metaphor, within the theatre viewing experience – this self-reflective irony is prevalent throughout the film. It has been achieved through detailed attention to the visual impact of the film's sets and effects, enabled by production design and massive expenditure. This furthers the proposition that productive attention has been weighted towards the technical delivery, the medium of the film.

The hero prototype is presented as internal, endemic to Jake's character, something that happens despite environmental pressures and personal circumstances, a part of history yet compelled and empowered to transcend it. It also represents Cameron's modelling of a new version of the American male action hero. From initially establishing Jake as disadvantaged, a victim of war, climate change, overpopulation and mass unemployment, we proceed to the discovery of Jake's "real" character: honest, straightforward, sensitive and heroic, even in the face of dominant sociopathic discourses. Jake's discursive positioning is disclosed through

the attention given to what he says, what he does and the ensuing disparities with the first-person narrative as voice over. In these scenes, Jake's interest in, and knowledge of science is established as minimal and his discourse reveals the average Marine's (or American male's) anti-intellectual attitudes:

Clip 46: Jake shows his lack of science

Clip 47: Jake shows his lack of science

Although the discourse of science remains problematic across his character's development, the ethnographic video log device enhances Jake's self-expression and he embraces it.

The point being made here is that Cameron accords a very high production value to the meaning made on the technical level, often at the expense of narratival clarity. His ongoing concern over future productions of the *Avatar* franchise remains this technical aspect. For this to be achieved, ideally, he will need to eliminate *all* polysemy at that level of audience cognition, i.e., at the level of perception.

3.3 Textual analysis: Attention schema and polysemy

The research process involved selecting a total of 120 clips for analysis and, of those, 21 are tagged with the word "polysemy". There is clearly not the space or the need to deconstruct each one – suffice to say that the film suffers from a lack of care taken in the construction of its intended meanings. This results in some confusion with the meanings that the film makes. While this study expects and has found that meaning-making is highly subjective and

contextual, much of the polysemy that occurs comes from errors in the film's construction. Some of the errors are a result of Cameron's own cultural myopia, others are because of incompletely understood authorial intent. This section teases these dynamics out.

This next scene's design is most confusing in the contradictory options for meaning-making available to audiences (consider the presence of Theodor Seuss' storybook in the jungle school: "*The Lorax*"):

Clip 48: Derelict indigenous school

This cautionary tale was written to advocate for environmental awareness. Its appearance here, in the context of children's literature and curriculum, ignites polysemous permutations to an extreme. Was Dr Augustine trying to tell the indigenous children something about learning to live well with nature? Clearly not, since Cameron is at pains to point out their harmonious balance. Was the message meant to be that Augustine was warning them? Was Cameron making a comment on the use of anthropology in mineral exploitation, signaling its obsolescence? Is it anti-intellectual? Could it be that the cultural artefact seen by Cameron as progressive environmental education material in real-life Western culture, was imported as a

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sort of muddled whimsy into the set of a film in an exotic world? Why the polysemy in the narrative and why the often-ambiguous depiction of the Weaver character?

"**The stingbats knock them down**", says Dr. Augustine, cementing the theme that "nature" reasserts the order of things. Possibly. And this in the context of the Seuss reference being missed by many audiences, (being only a few frames in duration) except possibly unconsciously as part of a filmic ambience.

As we have seen in this study, attention schema theory concerns itself with mapping out approximate models of our attention and those of others. It follows that audiences are influenced by what they read as the intended meaning of the author of the work and when this involves a film with as much media hype as *Avatar* enjoyed, even more so. Although authors and artists are part of their historical circumstances, individual agency and authorial intent are part of the nuanced mental schemation present at the point of consumption of any attention-demanding medium. It is therefore significant to this study that Cameron produced more polysemy in the narrative than he did with the technologies of his medium and it will be interesting whether sequels of *Avatar* will concentrate on clarifying his intended meanings, which are arguably more relevant than the vehicle for conveying those meanings. And Cameron, despite his obsession with the technical aspects of his work, is quite happy with this level of confusion and the resulting polysemy. In the following interview (Ditzian, 2010) he describes his audience reception understanding:

Clip 49: Cameron on *Avatar*'s politics

"*Avatar* confuses people because it's got all this cool eye candy and all this cool action, and if they're starting to feel something in the middle of that, it's kind of OK." Aesthetic response is important for Cameron and key to audience immersion and tolerance of differences, and therefore of the film's political messages "unless you're a hard right-wing pundit, in which case it's OK, and the whole movie's ridiculous and fatuous and stupid," Cameron jokes. However, he is quite clear on the meanings he would like audiences, other than those from the fringes of mainstream opinion, to take away from the movie.

In the next clip from the same interview (Ditzian, 2010), Cameron explains some of his thinking on the psychology of his meaning-making:
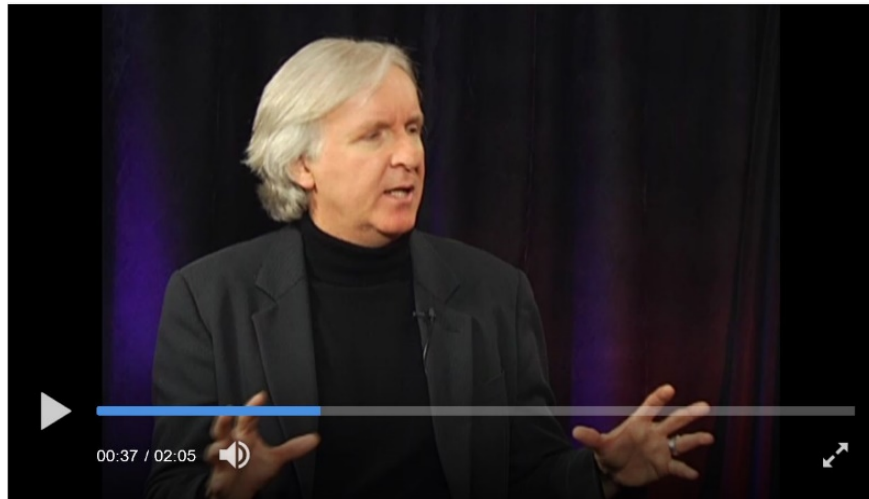
Clip 50: Cameron on environmental activism

We all know what's going on, we live in denial about it. Denial is a mental response based on fear, fear – of change, of the sacrifices we are going to have to make…. You have to fight an emotional response with an emotional response.

Cameron's intended meanings are clear in his own mind:

If you're tuned in to what's happening in Avatar, you start to feel a sense of moral outrage when you see the tree fall and it's a compassionate response for these people. Then you feel a sense of uplift at the end as good vanquishes evil. If you put those two things together, it actually creates a ripe emotional matrix for people to want to do something about it.

This study continues to make the connections between what is intended and that which is not in *Avatar* in the hope that audience meaning-choices are more clearly understood.

Turning to the philosophies Cameron synthesises in the value system he imbues to his story, this diptych illustrates the use of the attention accorded to indigenous communities:
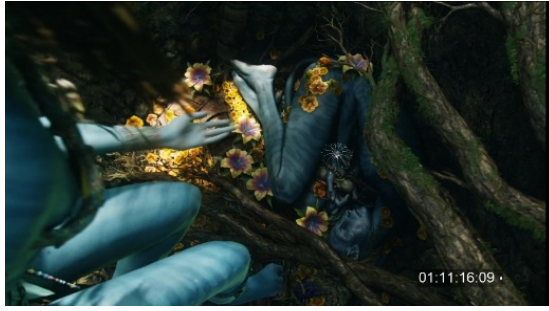
Clip 51: Na'vi burial rites

Clip 52: Neuropsych bonding with direhorse

In adhering to a purely Western view of nature, philosophy and the universe, the film portrays the indigenous as having the hierarchical right to subject nature to its control, albeit one that has more empathy on Pandora. The easy reliance on unexamined popular conceptions of Western ethnocentric imaginaries (including those of Eastern and indigenous origin) is often at odds with a more sophisticated state of knowledge of the above, especially amongst intellectual audiences. Cameron does not claim the epithet of intellectual, nevertheless his script would have been more effective if more rigorous and critical understandings had been employed in the scripting of *Avatar*. But, given the nature of polysemy in general and particularly as expressed in this film, coupled with its intended market priorities, any statement of meaning is necessarily subjective and contestable. Although all beings are connected in a neural network on Pandora, not all beings are equal. Was Cameron aware that the hierarchical assumption of humanoid superiority and power is problematic in the face of the need for harmony and co-dependence with the environment? Cameron's philosophy has been extensively researched by Doru Pop (2009) to trace the multitude of philosophical points of view incorporated into Cameron's popular ecologism but, suffice to say, that his philosophical views are so broad and popular in the sense of globalised discourses, that their ontologies are, if not irrelevant, not relevant enough for this analysis. This also applies to Pop's (2009) assumption that, what he calls Cameron's double mirror device to provide alternative and sometimes contradictory sets of meaning-making, is in fact intentional. But,

as I argue in this context, it is risky attributing such narratival coherence to an author when it is so clear that polysemy in *Avatar* is not always Cameron's intent. This applies especially to the ambiguity in the film's characters, as in the following Clip 53:

Clip 53: Parker with *unobtainium*

The phrase "hearts and minds" was first used in the context of the Vietnam war and this is a direct Cameronian reference in the film. It is clear that the film criticises war as a vehicle for profiteering however, as Clip 53 shows, the articulation of Parker's character as a sociopathic and predatory mining agent, is arguably overstated. If the intention was to evoke antipathy towards him, it potentially backfires because it invites an oppositional reading to the characterisation. This, among many other possible readings of the scene, opens intended meanings to a range of confusing and distracting messaging for audiences – leading to oppositional and negotiated meaning-making, with very different conclusions.

3.4 Findings

Chapter 3 suggests some early conclusions, specifically on the efficacy of cognitive cultural

studies to provide the perspectives on earning attention,[85] empathy[86] and narrative theory that I use to analyse the film.

From the preceding textual analysis, it appears that, for *Avatar* (and any cultural artefact), attention is deployed to make intended meaning by the author. But equally, intended meaning is negotiated at the point of consumption of the product and afterwards, in other places, and in other forms, by the audiences, who are not homogenous, but are forced into a shared experience. Attention shift is used to facilitate and leverage attitudinal shift.[87] But there are different (polysemous) meanings of the concept of *attention* held by divergent interest parties and the attention schema theory opens up this polysemy for analysis.

The chapter's findings indicate that, although a film like *Avatar* is technically innovative, it is thoroughly dependent on historically discursive filmic forms.[88] This said, form is integral to artistic and cultural production and attention schema theory engages with 3D as a form with the power to intervene on a perceptual level. Narratives must be entertaining and credible enough to be attitude or belief-changing and to make full use of the opportunities for new forms of attention that innovative forms introduce.

Directing audience attention within an environment in which intended meanings are consumed is then the task of art or cultural production, rather than the assumption of fixed meanings which are liable to be misunderstood, muddled and subverted. This requires a solid understanding of the effect of empathy and polysemy on meaning-making.

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[85] In so doing, constructing the meaning-making environment.

[86] As a mental schemation of others' subjective experiences.

[87] In terms of belief and values.

[88] i.e. its traditional language.

CHAPTER 4 *AVATAR* AND EMPATHY

4.1 Textual analysis: Empathy

A considerable amount of attention has been given to the construction of empathy in building Cameron's emotional response for audiences, since he uses emotional response as a rhetorical device in making his arguments and critique. But there is another important reason for paying special attention to empathy: its construction is needed to bridge the exclusion of other species, races and cultures in our personal empathy sphere. New forms[89] of relating to personal visual space and virtual (dis)embodiment are integral to digital media. Although neuroscience has long known of the ability of animals, including humans, to match even rough approximations of form in their media environments, with attachment (a cognitive habituated response, bonding and schemation), such attention shifts must be constructed incrementally in breaching audience credulity. The challenge though, for Cameron, is that he needs to progress viewers through a very rapid process of attachment; a process which must overcome resistance in audiences to inclusion of others not perceived as members of their group, whether it be on emotional, intellectual or ideological grounds. In short, Cameron needs audiences to shift their attention to accepting cross-species love. If Cameron can achieve this, even to a limited extent, his argument for human tolerance and acceptance is considerably strengthened. The next two scenes graphically show the challenge to audience narratival credulity – that of the acceptance of intimacy with the other, since human empathic response, although automatic in terms of mirror neuron excitation, is highly mediated by its context – cultural and individual.

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[89] Even to the extent of using different neural pathways to experience them.

Audiences must travel on an emotional developmental journey across social boundaries, starting at Jake as disabled and rejected, to Jake empowered through a new body, albeit an alien one. Cameron's task is then multifarious, complex and very rewarding if the film succeeds in these diverse levels and paradoxes:

Clip 54: Jake and Neytiri share love

Clip 55: Jake and Neytiri share love

The following series of clips featuring key quotes are presented here in a storyboard style, isolated to show the incremental intensity with which Cameron approaches our emotional attention on the level of the film's dialogue. Significantly, verbal dialogue gives way to the unspoken, the spectacular and an escalating music score that favours African-sounding choral arrangements:

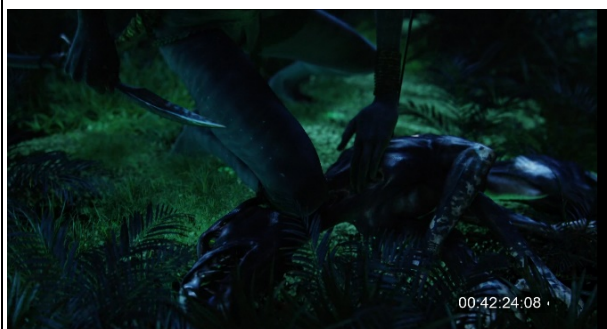|	
Clip 56: Bar scene	JAKE: "**Let's get it straight up front. I don't want your pity. I know the world's a cold-ass bitch.**"
Clip 57: Cremation scene	CORPORATE AGENTS: "**We'd like to speak to you about taking over his contract and since your gnome is identical to his, you could step into his shoes – so to speak.**"
Clip 58: Male scorn and othering	MERCENARIES: "Check this out, man, meals on wheels." "**Oh man, that's just wrong.**"
Clip 59: Neytiri mercy-killing of viperwolf	NEYTIRI: (in Na'vi) "**Forgive me, my brother.**"
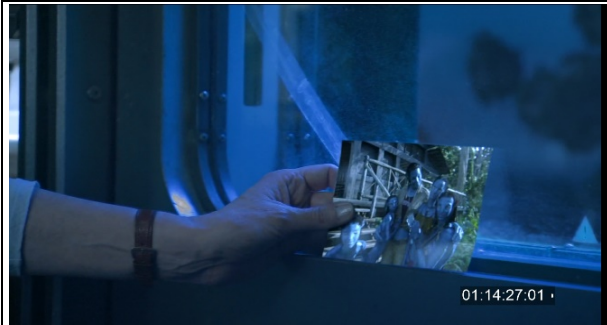
Clip 60: Jake's empathy for fate of school kids	JAKE: "**I'm sorry.**"
Clip 61: Direhorse on fire	Sound of fire raging
Clip 62: Jake and Neytiri share love	Theme orchestral music
Clip 63: Na'vi final celebration	Theme Choral music
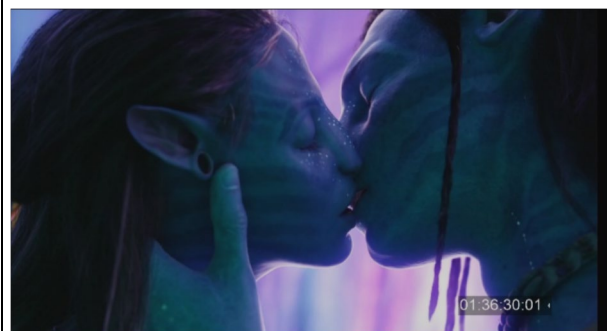
But empathy is a complex affair and Cameron does not shy away from exploring the limits of an empathically-driven culture. In Clip 64, Jake is asked to end Tsu'tey's life, to perform an act of ultimate empathy and moral courage. This scene was omitted in the screen release, due to the assumed moral sensitivity of theatre audiences.
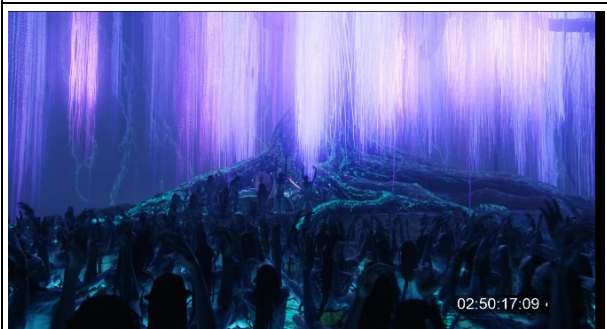

Clip 64: Tsu'tey's euthanasia

The studio presumably thought it was dealing with a different, possibly broader audience when it released this cut scene in the Extended Collector's version, on which this discourse analysis is based. This is a climactic moment in the film and a culmination of a long series of empathy-building scenarios that the audience shares with the protagonists.

Avatar's creator views his own efforts in an artistic light, designing and physically drawing most of the visually specific elements of the "world" *Avatar* exists in.[90] Years in the making, and in his directing, Cameron quite consciously searches for an emotional effervescence in his actors, which "releases the magic."[91] He regards the creative process as "bringing your

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[90] As he did in the film *Aliens* where he collaborated with H.R. Giger.

[91] James Cameron, Brent Dunham (2012). *"James Cameron: Interviews"*, p.116, Univ. Press of Mississippi
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imagination into manifestation" (Cameron, 2010a). This study interrogates Cameron's tools and choices for materialising these ideas in his storytelling and how this impacts on our cognition and meaning-making as audiences.

4.2 Textual analysis: Empathy and polysemy

Meaning through empathy is made polysemous through interactions between meanings from different parts of the medium – well depicted in this early scene (Clip 65 below). There is an obvious disconnect between Jake's voice-over narrative and his actions, between the expressed values in those narratives and the counter-values he acts upon:

Clip 65: Jake switches attention

It is useful to consider the original script[92] to uncover how audience attention is designed to shift between meaning choices and how audiences are encouraged to develop their own oppositional readings of surface meaning presented in the dialogue:

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INT. ROWDY BAR – NIGHT Not the kind of place you'd bring
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your mom. We find Jake near the pool table, BALANCING his chair, front wheels off the ground, while holding a tequila shot on his forehead. ONLOOKERS, including some other disabled vets, CLAP and WHOOP. Jake grabs the glass, SLAMS down the shot as they cheer. A WALL-SIZED SCREEN filled with the World Cup game – men RUNNING on antelope legs. CU JAKE, watching what he can't have. Expression stony. JAKE (V.O.) **'Let's get it straight up front. I don't want your pity. I know the world's a cold-ass bitch**.' Jake's eyes shift – HIS POD, seeing the bar through gaps in the crowd. A MAN on a barstool SLAPS the WOMAN he's with. Hard. She cowers but he's got her arm, shouting, raising his fist. An eternal tableau. People look away. CU JAKE – not looking away. TIGHT ON JAKE'S HAND as he starts pushing the wheel of his chair. TRACKING WITH HIM as he rolls forward.

JAKE (V.O.) **'It's just the way things are. And nobody You want a fair deal, you're on the wrong planet. The strong prey on the weak. Nobody does a damn thing**.' Jake stops, unnoticed, next to the bullying man. He leans down and grabs one leg of the man's barstool – and YANKS. The chair flips. The guy goes down HARD and JAKE hurls himself from the wheelchair, toppling on the guy, getting a grip on him like a pit bull and PUNCHING the crap out of him, right there on the floor.

It is worth noting that this scene shows a shifting perspective as regards Jake's attention. First, the centre of attention in the crowd, then an abrupt camera cut showing his self-reflective observation of the soccer game on a screen (a simulacra of healthy athletes running and kicking), then to a woman being bullied. In other words, Jake's attention moves from self-gratification to an empathic, protective mental schema of the situation in the bar, which leads to selfless action.

However, there is another sense that meaning, through empathy, is made polysemous – directly, through dialogue. Scenes which are written as interactions between characters reveal the intention of the writer in respect of overt meanings since they rely on a more directive verbal narratival level than the meta-narrative Cameron employs for some of his other intended meanings. It should therefore follow that, where polysemy appears in the dialogue, that that polysemy is intended or it needs to be seen as accidental. But it is exactly the problem of intention that is the fuzziest to define:
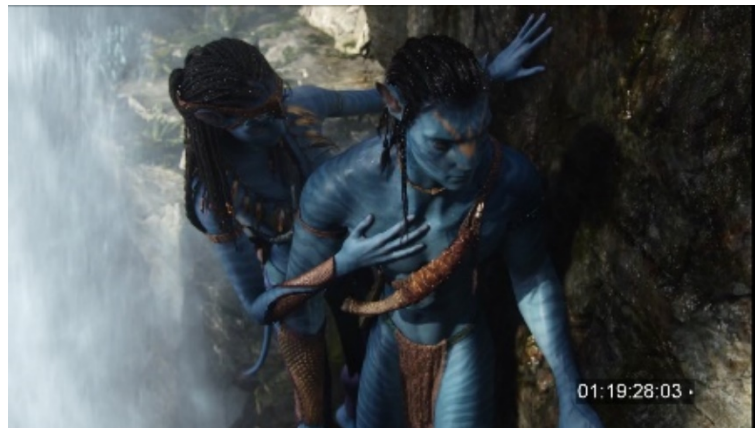
Clip 66: Neytiri and Jake share an empathic moment

NEYTIRI **'This you must feel inside … You will have one chance, Jake.' 'How will I know if he chooses me?' 'He will try to kill you.'**

In the context of one of the first empathic touches between Jake and Neytiri, Neytiri sketches a view of Pandora as a place where only the fittest survive but, by fittest Darwin meant *fittest*, not *strongest* and, in this context, the most *empathic*. The view of evolution, as necessarily conforming to earth's DNA reflecting a patriarchal, violent view of history, is challenged by Cameron's introduction of hexapods and bizarre flora but he appears to subscribe to the

mainstream confusion about evolution as conflict.[93] The dialogue in this scene serves to heighten drama but at the expense of interrogating our power relations with nature, terrestrial or other, and therefore with other species, races and cultures. This, I would argue, introduces an unintended, even unexamined, range of meanings into the dialogue, compounded by even more confounding visuals. The following exchange between Augustine and Sully shows where they agree, while the direction suggests that Cameron thought they should not, shows the historical loss of status academics are experiencing in the face of pressing economic imperatives:
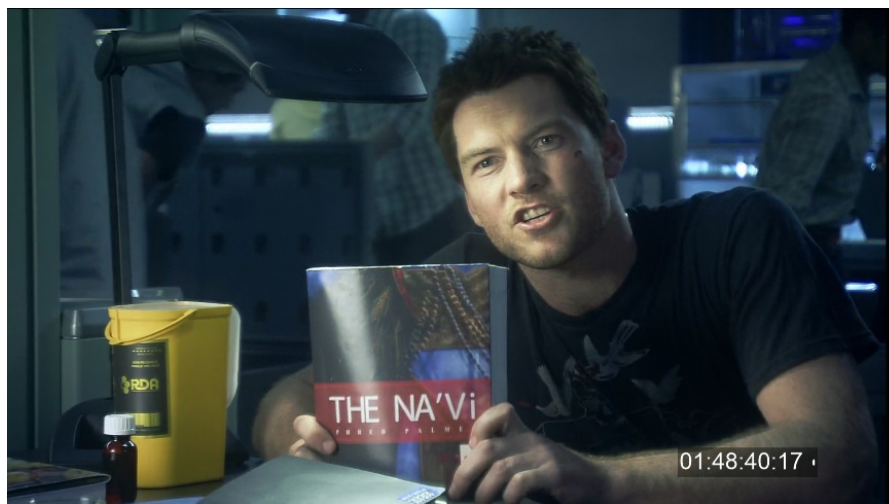
Clip 67: Jake argues with Augustine on policy

But the meaning-making is muddled and the resulting polysemy in this scene includes the perception that Cameron was certainly making a point about war and provocation, to the detriment of the logical flow of his script. This leads to confusion for the viewer as to whom to support in this argument – that is not an argument. In the following three scenes, at Augustine and Jake's first meeting and her subsequent complaints to Parker Selfridge,

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[93] It is no surprise then to find the Avatar Theme Park as part of Disney World's Animal Kingdom, Orlando Florida.

Weaver's dialogue is so ill-considered and implausible that it forces an ambiguous characterisation of Dr Augustine which the film continues to compound to an unclear purpose. This often pits dialogue against narrative, performing functions of what Cameron intends to be made clear in the story, at the expense of his characters.

Clip 68: Jake meets Augustine   **Clip 69: Augustine confronts Parker**   **Clip 70: Parker and *unobtainium***
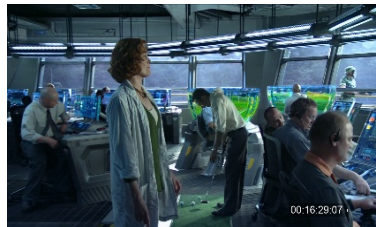
4.3 Findings

An enormous expenditure of filmic directorial attention has been spent on *Avatar*'s engagement with empathy since it is Cameron's view that attitudes can be changed by using empathy as a rhetorical device in an emotional environment of immersion in his action-packed spectacular "eye-candy".[94] There are undeniable opportunities in new forms of filmic experience, but deploying this technology must be used incrementally in order to be acceptable to most viewers. Likewise, a textual analysis of *Avatar*'s use of empathy indicates the film's use of shifts in director's and actors' attention (their gaze) and that a rift is created in audience perceptions of messaging. This tension results in a counter-discourse, which is the film's intended meaning. In that sense, polysemy is built into the film's messaging to provide for a wide range of commercial successes, as much as it is part of the craft of Cameron's persuasion. But unintended meanings also proliferate since the way attention has been invested in highlights the film's priorities and areas of improvement.

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[94] As part of his idea of his persuasive power, see http://www.mtv.com/video-clips/jsu5l4/james-cameron-talks-about-the-political-response-to-avatar

CHAPTER 5 CONCLUSIONS

This chapter collates and evaluates the findings relating to the central problem of the study, which is an explanation of *Avatar*'s achievement in offering a successfully polysemic meaning-making experience for audiences despite, or perhaps because of its many contradictions.

The aims of this study were, firstly, to show the complementarities of cultural studies and cognitive science in the critique of cultural objects and, secondly, through those lenses to undertake a cognitive and cultural materialist analysis of *Avatar*, as an exemplary case study in that critique. However, any informed analysis changes the textual reading of a text and, by subjecting it to its conceptual mould, increases its meaning. If it is broadly axiomatic that an analysis, done using the underpinning of a theory/theories, is always more structured and relies less on an intuitive approach to any cultural text, then the selection of theories used becomes crucial. The preceding chapters provide the case study specificity required to demonstrate the arguments around the use of attention and empathy in meaning-making in *Avatar* and, in so doing, serve the overarching aim of the study: to put the "cognitive" back into cultural studies.

Polysemic, often contradictory and even paradoxical ranges of meaning-making by *Avatar* audiences are revealed in media responses to the film. The argument is made that the analysis of those responses requires the use of cognitively oriented models (reconceived as schemas) of explanation. These originate in biology and, more specifically, in neuroscience, cognitive narratology and certain conceptions of critical discourse theory and are collectively adapted as a fresh approach to cultural studies. This research contributes to the project of reimagining

the field as *cognitive* cultural studies. The study found, especially in cognitive cultural studies'

deepening of critical discourse analysis beyond the purely cultural and historical, significant

conceptual references to the evolutionary-informed meta-discourse of the physical sciences

in the interdisciplinary collaboration. This is directly due to the influence of evolutionary

theory prevalent in those sciences. In section 2.3, the links between Graziano's views of the

construction of the personal self as an adaptive survival mechanism of consciousness are

tracked through Gazzaniga's account of the history of philosophical speculation in this regard.

The historical turning point, represented by Darwin's detailed biological research, took that

thought into empirical validation and proved to be fundamental in later work in clinical

physiology and experimental psychology. Tracking the growth of this firmly established trend

of evolutionary thinking in the social sciences will continue to be interesting on an

epistemological level. The development of a cognitively informed view of meaning-making

and therefore of the interpretation of texts, especially in the work of Hogan, Boyd, Herman

and others that underpin the analysis in this present study, lends credibility to the notion of

re-inserting the word "cognitive" into the term "cultural studies".

The relevance of cognitive neuroscience and its relationship to understanding polysemy is

broadened to other frameworks of *Avatar*'s narratives; networks, neuro-technology, cognitive

psychological manipulation and neuro-marketing are shown for their innovative and creative

relevance to meaning-making in the production cultures of the fictional film industry. A

systematic approach to the mechanics of narrative employed in this analysis, involved an

interplay between universal species-enacted cognition and historical discursive specificity,

with culture being the preeminent category for this specificity. Narratives must be entertaining

and credible enough to be attitude or belief-changing in order to make full use of the

opportunities for new forms of attention innovative forms introduce. This said, form is integral

to artistic and cultural production and attention schema theory engages with 3D as a form with the power to intervene on a perceptual level.

From the textual analysis, it appears that, for *Avatar* (and any cultural artefact), attention is deployed to make intended meaning by the author. But equally, intended meaning is negotiated at the point of consumption of the product and afterwards, in other places, and in other forms, by audiences who are not homogenous but are nevertheless forced into a shared experience. Similarly, individual members of audiences prioritise different attention points in the film, producing and amplifying some forms of attention to the detriment of others. Directing audience attention within an environment in which intended meanings are consumed is then the task of art or cultural production, rather than the assumption of fixed meanings which are liable to be misunderstood, muddled and subverted. This requires a solid understanding of the effect of empathy and polysemy on meaning-making and was, I think, clearly indicated in the textual analysis of *Avatar* in Chapters Three and Four.

A shift of attention is used to facilitate and leverage attitudinal shift[95]. But, in an analysis of *Avatar*, there are different (polysemous) meanings of the concept of *attention* held by divergent interest parties and the attention schema theory opens up this polysemy for analysis, as is demonstrated by the extensive discussion of Graziano's work.

While the cognitive and species-specific biological components and working mechanisms of humans provide for a vast range of cultural possibilities within our own bodies' confines, a critical, discursive approach is essential to making sense of the way the elements of history and biology fuse in any one moment, in any particular culture. A systematic narratival

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[95] In terms of belief and values.

approach to the analysis of texts likewise mitigates against inherent subjectivities in all[96] meaning-making but, rather than achieving objectivity, it corroborates evidence in support of particular discourses.

Extremely immersive media technologies lead to an increase in the monopolising of attention during the act of consumption of the media product to the extent they can be said to have the inherent danger of colonising attention for the purposes of producing certain kinds of awareness.[97] This heightens the importance of a cognitively informed approach to mental schemation in the conception and creation of cultural products in general. For example, in the first few minutes of the film, the *Avatar* script repeats the phrase, "Watch it!" three times, both as a device to call attention to Jake's vulnerability, but also as an overt admonition to the audience to pay the requisite attention to the film's messages. In the same way, Neytiri repeatedly admonishes Jake for his "baby" status in the milieu of Na'vi social capital, similarly encouraging the audience to accept our own inexperience in cultural exchange. This use of cognitive psychology-informed rhetorical devices is consciously deployed in the film. Applying cognitive knowledge to this process of meaning-making greatly capacitates cultural studies in that it uses the appropriate tools to uncover the manipulation of responses to the film,

The reformulation of Bakhtin's structural landscaping, as constituted by something akin to chronosomatopes, is modelled on the analogous coordinates of time, body and space in the mental schematic. When coupled to the narratival (culturally entrained) and diegetic compulsions of semiosis, it reveals possible opportunities to detail the

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[96] i.e. consumer and analyst consumption of artefacts.

[97] Especially important for producing compliance to advertising, propaganda and false news.

particularities of discourses in terms of how they construct relationships between time, space and the bodies involved in those configurations. In that sense, the discourses lie somewhere in the hypothetical space between a product, such as a novel, and the stories that our brains tell us about who we are – the one producing the other in a lifelong dialectical loop.

The research uncovered the issue of the cognitive load represented by empathic engagement with semiotic representations of the other, the emotional and material costs of such engagement, and the reschemation of personal and cultural mental models to accommodate such shifts. And, far from only preventing evolutionarily necessary changes in attitudes to outgroup stereotyping, this process is continual and porous, even if, paradoxically, existing attitudes and models are defended vehemently. They still function as open to persuasion and change, reprioritisation and growth, albeit always, to a greater or lesser extent, negotiated and partial. This has direct implications for other audiences (besides juries) since according inordinate importance to personal culpability and agency involves "systematically discounting the important social, historical, and situational determinants of behavior … and correspondingly exaggerating the causal role of dispositional or individual characteristics" (Lynch & Haney, 2011). This appears to have a bearing on how we ascribe attention and agency to the stakeholders in commercial communication events – audience, artist, critic and market.

The point being made here is that Cameron accords a very high production value to the meaning made on the technical level, often at the expense of narratival clarity. His ongoing concern over future productions of the *Avatar* franchise remains this technical aspect and, for this to be ideally achieved, he will need to eliminate *all* polysemy at that level of audience cognition, i.e., at the level of perception. It is highly likely that the ongoing franchise of the *Avatar* brand will give Cameron the technical experience and therefore the resulting narratival

attention needed to perfect the physiological reception of his medium. This may then, at the level of meaning-making, facilitate his commitment to provide a little of everything for audiences, i.e. his commitment to polysemy in his films' messages, without compromising the messages of change he appears committed to.

In undertaking this research on this specific film, the impact of emergent cultural phenomena in digital media was assessed for its contribution to contested meaning-making and highlighted the role of technology in facilitating meaning. This, in turn, recognises the concomitant increasing need for global media literacy. Debates on the responsibility of academics and artists, in both their individual and social capacities, are greatly enhanced through the lens of attention schema theory. In this view, artists become custodians of social cognition that is built on the recognition that social cognition manufactures social reality. With the rise of our global information society, philosophy has become popularised and themes pertinent to the meaning of recurring philosophical issues abound in *Avatar*. These are mind/body dualisms, life as constructed reality (in the post-modern sense as well as in the mechanistic), free will, the nature of mind and the inevitability of power's corruptive force. As such, the fact that the film draws attention to attention as an internal awareness process intrinsic to consciousness (in the attention schema theory sense of the terms) is a kind of narratival response to contemporary social contradictions and divisions. Philosophical concerns in filmic creation are not new – how *Avatar* achieves a lens to current philosophical concerns is innovative in the attempted welding of message and medium (in the McLuhanian sense). It is difficult to disentangle the two in *Avatar'*s production and, for most, Cameron's filmic medium advances may always feel like the message itself.

However, attention schema theory used for textual analysis is not something that is being readily attempted. While there is considerable support of cognitive science-informed

methodologies (Boyd, Hogan, Herman) in textual analysis, attention schema theory is not yet deployed in textual analysis. This can be explained by the need for the addition of complementary critical theory disciples of discourse studies and political economy unified under a framework such as cultural studies. Forms of interdisciplinary research require mastery of its sub-disciplines and, since these disciplines are under-synthesised in their theoretical articulations, a working knowledge of discrete disciplines is required – currently implying years of learning. While admittedly far from fully developed, this study is an attempt to encourage further use of attention schema theory as an interpretive science by demonstrating the value of working on a fully functional set of tools offered by cognitive cultural studies.

Since empathy is part of the cognitive structure of mental schemation, it is always present in social cognition. Social cognition is a determinant of the forms that problem solving takes in cultures resulting in even a pursuit, such as pure mathematics, being fraught, for example with empathically-informed mental schemation of colleagues' expectations and their need for funds to continue their research. In that sense, empathy is always useful to consider in the context of the social cognition of cultural artefacts but, in *Avatar*, it was especially effective, since empathy was used as a persuasive tactic and its deployment in the film can be recognised as a structural rhetorical device. The construction of this device has been thoroughly exposed by a cognitively-informed approach to empathy and emotion.

Although human empathic response leading to the acceptance of intimacy with the other, although automatic in terms of mirror neuron excitation, is highly mediated by its context – cultural and individual. Audiences must travel an emotional developmental journey across social boundaries, starting at Jake as disabled and rejected, to Jake empowered through a new body, albeit an alien one.

The analysis of *Avatar* has shown that attention shifts must be constructed incrementally to be credible to audiences. The challenge though, for Cameron, was that he needed to progress viewers through a very rapid process of attachment, which needed to overcome resistance in audiences to the inclusion of others not perceived as members of their group, whether on emotional, intellectual or ideological grounds. In short, Cameron needed audiences to shift their attention to accepting cross-species love. The extent to which Cameron achieved this, even to a limited extent, strengthened his argument for human tolerance and acceptance. Cameron's task was multifarious, complex and very rewarding in the ways the film succeeds in those diverse levels and paradoxes.

However, paradoxically, a film would not be considered immersive if its messages could not even temporarily suspend the analytic perspectives of an analyst. But, since meaning, even of an immediate delivery medium such as film, is made over time and social space, the impact of the film on the analyst is highly mediated according to the analytic tools framing its methodology.

The polysemy of the film is amplified by the highly divergent foci of the theories in the literature review. Viewed from an environmental point of view, the film could be considered progressive but, from a political economy perspective, the contradictions in interest and representation are apparent in the film. From a gender studies perspective, meanings attributed to the representation of women in the film indicate new methods which show up old stereotypes. Conversely, from an anthropological view, the film may be seen as celebrating matriarchy and ritual in communal living yet, at the same time, the film attacks anthropology as a discipline implicated in corporate expansion which offers ambiguous rewards for indigenous peoples, whilst cyber study futurists celebrate the possibility of an evolutionary jump into machine consciousness. Not only is there something for everyone's mental

schemation in the audiences' meaning-making, it appears to be the case for academic analysts too, with the range of interpretations corresponding to the number of interpretive frameworks employed.

Likewise, ideological positioning is a powerful attributor of meaning and the film has interesting paradoxes for ideologues. The contradiction presented by the framing of Cameron's characters, as either subjects or agents of their reality-based counterparts, is a case in point. If Palestinians who protest adorned in blue paint indeed proclaim the need for a foreign saviour to realise their goal of throwing off the yoke of Israeli occupation[98] then, in this context, a discourse critical of Western capitalism legitimates its subject, engraining a perspective that remains hidden behind the seemingly scathing critique. But similarly, it can be argued that the Palestinian, looking to raise awareness of his/her captivity, has a right to his/her own meaning-making and does not require the analyst to point out a contradiction that may not be the lived experience of that Palestinian.

But *Avatar* shows up another ambiguity. In the context of misrepresentations of indigenous real-life actors and their very real issues and interests, the film exploits their circumstances to provide fodder for a Western industrial audience.[99] However, an oppositional reading to that is that displacing them to another planet may have the effect of providing audiences with an alternative, and more respectful, context in which to gain understanding about what being indigenous might mean (Taylor, 2010). This interpretation is hinged on a sort of simulated attachment we may experience to *Avatars*, which we may not be able to countenance in real life – a simulacra of original experience mediated by fictionally narrated experience, a kind

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[98] https://shokrylina.wordpress.com/2013/06/24/re-visiting-the-racism-in-james-camerons-avatar/

[99] Deloria (1998), Churchill (1998), and Krech (1999)

of role-play exercise, with Bettelheimian overtones.[100]

Additionally, the argument is made that the scholarship itself indicates the power that discursive formations have in influencing the meaning-making of cultural artefacts. In this context, it is exercised by many academics and the ways in which *this* study panders to a critical theory perspective is no exception.

For those academics that are tasked with teaching, the exercise of power in media products is often predicated on illiteracy and the resulting vulnerability to the co-option of audience attention. This study clearly shows the importance of more sophisticated programmes for advanced media literacy and the urgent need for that literacy to be disseminated on a popular level.

Avatar is a block-busting exemplum of its genre and the lessons learnt in its analysis are transferable to other films, with different genres. I would go so far as to say that the scientific principles of observability, formulation, testing and modification of hypotheses, and reproducibility underpinning this work are transferable to analyses of similar films and other cultural texts.

The onus falls on the success of a multi-disciplinary corroboration[101] of the explanatory power of its analysis. It is my view that the dichotomy of culture and cognition is plausibly reconciled in this study and represents validation for the recent interest in a newly conceived "cognitive cultural studies". Through the selective application of this interdisciplinary approach, the

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[100] in his fusion of myth and psychoanalysis. See Bruno Bettelheim, *The uses of Enchantment: The meaning and importance of fairy tales* (1976) London: Thames & Hudson.

[101] More accurately, "synthesis".

study contributes to an understanding of what cognitive cultural studies research denotes – used with reference to the recent increasing accessibility of knowledge about the brain. More particularly, this study's title, *Neural narratives and natives: Cognitive attention schema theory and empathy in the film, Avatar*, appears to me to have been a useful snapshot of the tasks and framing informing such interdisciplinarity.

Speaking personally, immersion into these theories has provided rich sets of layers of meaning to my appreciation of *Avatar*. The understanding of attention schema theory has been cognitively demanding and, at times, has slipped from my conscious attention, like understandings of the dialectic or particle physics. The comprehension of this knowledge has enriched all levels of my cognitive experience. The understanding of empathy's almost schizophrenically paradoxical functions in social cohesion and violence has impacted on my own emotional experience of my life.

The exercise of analysis on the film at this level has made me aware of the neuroscience of audience manipulation and marketing in the construction of its polysemy. Adding cognitive perspectives to my practice as a media producer and cultural studies theorist has rejuvenated my capacity to be more creative and live a more useful life, in short, to create myself as a work of art.

EPILOGUE

As we threaded our way through the return crowds of anecdotal evidence at a Florida Disney resort to check in and sign up for a timeshare sales pitch cleverly disguised as breakfast, I considered this new level of transmedia simulacra. Extending the illusion of film to the duplicity of commercial practice, Hollywood culture is built and exported through repeat experiences, where the novelty of entertainment gives way to the comfortable safety and familiar packaging of material (and family) needs.

Figure 3: Disney World badge

My First Time Visitor badge being the potential beginning of a lifetime relationship with Disney, ending with the bequest of my timeshare to my descendants, I checked on its authenticity and was relieved to see that it was genuine.[102] Firstly, it was metal, but more importantly, it had been issued by a real cast member[103] at Pandora. Being a symbol of the transience of filmic immersion and hype extended and transcended through time, culture and a spurious habitation of advertising space,

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[102] http://collectivepop.com/top-10-most-expensive-disney-trading-pins/

[103] Where *cast* is a Disney employee.

I examined my free button closely. The badge is a simulacrum of a simulacrum – the bringing into the material of a fleeting fictional experience, itself multi-layered sets of simulacra. If I continue to collect these badges, I may one day sell mine for real money, completing the meaning-making circuit of this artefact in its representation, identity, production, consumption and its regulation, and the transformation of its meaning into capital.

BIBLIOGRAPHY

Alessio, D. & Meredith, K. 2012. Decolonising James Cameron's Pandora: Imperial history and science fiction. *Journal of Colonialism and Colonial History*, 13(2, Fall). Available at: http://muse.jhu.edu.i.ezproxy.nypl.org/ article/483772 RD 2017/06/26/23:02:30

Anderson, C. 2009. Critical indigenous studies: From Difference to Density. *Cultural Studies Review,* 15(2).

Auster, L. 2010. Cookie-Cutter Anti-Americanism + $100 Million in Special Effects = *Avatar.* Available at: http://www.amnation.com/vfr/archives/015330.html

Bakhtin, M. M. 1981. Discourse in the novel. In M. Holquist (Ed.), *The dialogic imagination: Four essays by Mikhail Bakhtin*, translated by C. Emerson & M. Holquist. Austin, TX: University of Texas Press: 259-422.

Bakhtin, M. M. 1988. Forms of Time and the Chronotope in the Novel. In M. Holquist (Ed.), *The Dialogic Imagination: Four Essays*. Translated from the Russian by Caryl Emerson and Michael Holquist. Austin, TX: University of Texas Press: 84.

Balsamo, A. 1996. *Technologies of the Gendered Body: Reading Cyborg Women*. Durham, NC: Duke University Press.

Beck, D. & Kastner, S. 2009. Top-down and bottom-up mechanisms in biasing competition in the human brain. *Vision Research*, 49(10): 1154-1165.

Bordwell, D. 2002. Film Futures. *SubStance*, 97(31): 1.

Bortolussi, M. & Dixon, P. 2015. Memory and mental states in the appreciation of literature.

In P. F. Bundgaard & F. Stjernfelt (Eds.), *Investigations into the phenomenology and the ontology of the work of art: What are artworks and how do we experience them?* Heidelberg: Springer: 31-49.

Boyd, B. 2009. *On the origin of stories: Evolution, cognition and fiction.* Cambridge, MA: The Belknap Press of Harvard University Press.

Boyd, R. & Richardson, P. J. 2005. *The origin and evolution of cultures.* New York: Oxford University Press.

Buckland, W. 2000. *The Cognitive Semiotics of Film.* Cambridge: Cambridge University Press.

Cameron, J. 1999. *Academy of Achievement Interview.* [Video] Available at: https://www.youtube.com/watch?v=dkHeJOFsQPc RD 2017/06/22/21:21:46

Cameron, J. 2009. *Avatar.* [Motion picture]. Los Angeles, CA: Lightstorm Entertainment.

Cameron, J. 2010a. *Avatar.* [DVD]. Los Angeles, CA: Lightstorm Entertainment.

Cameron, J. 2010b. Before Avatar … a curious boy. [TED talk]. Available at: https://www.ted.com/talks/james_cameron_before_avatar_a_curious_boy

Caracciolo, M. 2013. On the Experientiality of Stories: A Follow-up on David Herman, Narrative Theory and the Intentional Stance. *Journal of Literature and the History of Ideas,* 10(2): 197-221.

Casagrande, D. 2004. *Power and the Rhetorical Manipulation of Cognitive Dissonance.* Paper

delivered at the Presidential Session of the Annual Meeting of the American Anthropological Association. Dec. 15-19. Atlanta, GA. www.lehigh.edu/~dac511/pdfs/Casagrande_power&cogdiss_AAA2004.pdf RD 2017/06/28/1:32

Čehajić, S., Brown, R. & González, R. 2009. What do I care? Perceived ingroup responsibility and dehumanization as predictors of empathy felt for the victim group. *Group Processes & Intergroup Relations, 12*(6): 715–729. https://doi.org/10.1177/1368430209347727

Chalmers, D. 2005. *The Matrix as Metaphysics*. In Grau, C. (Ed.). *Philosophers Explore the Matrix.* New York: Oxford University Press. Available at: http://consc.net/papers/matrix.html RD 2017/01/25/18:22

Clarke, J. 2014. Focaal—Journal of Global and Historical Anthropology 70, 2014

Collins, M. 2014. Echoing Romance: James Cameron's Avatar as Ecoromance. Mosaic *(Winnipeg)*, 47(2). Available at: https://www.questia.com/library/journal/1G1-370213356/echoing-romance-james-cameron-s-avatar-as-ecoromance

Project MUSE Mosaic: a journal for the interdisciplinary study of literature Vol. 47; 2, June 2014 https://muse-jhu-edu.i.ezproxy.nypl.org/article/547063 RD 2017/06/26/23:08:57 (authors unnamed).

Corporate Valley. 2013. *James Cameron Exclusive Interview* [Video]. https://www.youtube.com/watch?v=F7cLXHYIDeM RD 2017/06/22/23:40:29

Cubitt, S. 2012. Avatar and Utopia. *UK Animation: An Interdisciplinary Journal*, 7(3) 227-

237. DOI: 10.1177/1746847712456263

Darwin, C. 1860. *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. First American edition, fourth printing, revised and augmented. New York: D. Appleton.

De Borst, A. & De Gelder, B. 2015. Is it the real deal? Perception of virtual characters versus humans: An affective cognitive neuroscience perspective. *Frontiers in Psychology*, 6(576). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4428060/ RD 2017/05/31/20:16:57

De Dreu, C. K. et al. 2010. The Neuropeptide Oxytocin Regulates Parochial Altruism in Intergroup Conflict Among Humans. *Science*, 328(5984): 1408–1411.

De Lange, C. 2017. The fragility of you. *New Scientist,* 235(3136): 40-41.

Dennett, D. 2003. Who's On First? Heterophenomenology explained*. Journal of Consciousness Studies,* 10(9-10): 19-30.

Denno, D. W. 2016. Foreword: Criminal Behavior and the Brain: When Law and Neuroscience Collide. In D. Denno (Ed.), *Criminal Behavior and the Brain: When Law and Neuroscience Collide.* New York: Fordham University School of Law.

De Shadley, R. 2009. Neuroscience, Hinduism, and Avatar. Available at: https://rinth1989.wordpress.com/2009/12/23/neuroscience-hinduism-and-avatar/ RD 2017/05/31/19:31:21

Ditzian, E. 2010. James Cameron says 'Avatar' is Inspiring Environmental Activism.

Available at: http://www.mtv.com/news/1632038/james-cameron-says-avatar-is-inspiring-environmental-activism/

Doyle, D. 2015. Art, Virtual Worlds and the Emergent Imagination *Project MUSE Leonardo* 48(3): 244-250.

Du Gay, P., Hall, S., Janes, L., Mackay, H. & Negus, K. 1997. *Doing cultural studies: The story of the Sony Walkman*. London: Sage Publications in association with the Open University.

Eckermann, E. 2002. Foucault, embodiment and gendered subjectivities: The case of voluntary self-starvation. *Academy for the Psychoanalytic Arts*, 2002: 1-17. https://www.academyanalyticarts.org/eckerman-foucault RD 2017/06/25/19:10:46

Efland, A. 2002. *Art and Cognition: Integrating the Visual Arts in the Curriculum*. New York: Teachers College Press.

Erb, C. 2014. Spiritual Blockbuster: Avatar, Environmentalism, and the New Religions. *Journal of Film and Video*, 66(3).

Fairclough, N. 1992. *Discourse and Social Change*. Cambridge: Polity Press.

Fairclough, N. 1992. Discourse and Text: Linguistic Intertextual Analysis within Discourse Analysis. *Discourse and Society,* 3(2): 193–217.

Fairclough, N. 1995. *Critical Discourse Analysis.* Harlow, UK: Longman.

Fairclough, N. 2003. *Analysing Discourse.* London: Routledge.

Fairclough, I. & Fairclough, N. 2012. *Political Discourse Analysis: A Method for Advanced Students*. London: Routledge.

Fairclough, N. 2003. *Analysing Discourse: Textual Analysis for Social Research*. London: Routledge.

Fairclough, N. 2014. *Language and Power* (3rd edition). London: Longman.

Fairclough, N., Jessop, B., Sayer, A. 2001. *Critical Realism and Semiosis.* Paper presented to International Association for Critical Realism Annual Conference, Roskilde, Denmark, 17-19th August.

Fernandez, R. 2014. The Somatope: From Bakhtin's Chronotope to Haraway's Cyborg via James Cameron's Dark Angel and Avatar. The Journal of Popular Culture, 47(6).

Forgacs, D. & Hobsbawm, E. J. (Eds.). 2000. *The Antonio Gramsci Reader: Selected Writings 1916-1935*. New York: NYU Press.

Foucault, M. 1961. *Madness and Civilization: A History of Insanity in the Age of Reason*. Translated from the French by R. Howard. New York: Vintage Books.

Foucault, M. 1972. *The archaeology of knowledge and the discourse on language.* Translated from the French by A. M. Sheridan Smith. New York: Pantheon Books.

Foucault, M. 1983a. *This is not a pipe.* Translated and edited by James Harkness. Los Angeles, CA: University of California.

Foucault, M. 1983b. *M. Foucault: Beyond Structuralism and Hermeneutics*, 2nd edition.

Edited by H. Dreyfus and P. Rabinow, Chicago: University of Chicago Press.

Foucault, M. 2006. *History of Madness*. Edited by J. Khalfa, translated by J. Murphy. New York: Routledge.

Gallese, V. & Cuccio, V. 2015. The paradigmatic body: Embodied simulation, intersubjectivity and the bodily self. In T. Metzinger & J. M. Windt (Eds.) *Open MIND*. Frankfurt a. M., GER: MIND Group.

Gazzaniga, M. 2018. *The Consciousness Instinct* [Kindle Edition]. New York: Farrar, Straus and Giroux.

Geertz, C. 1973. *The Interpretation of Cultures: Selected Essays.* New York: Basic Books.

Golombek, P. & Johnson, K. 2004. Narrative inquiry as a mediational space: Examining emotional and cognitive dissonance in second-language teachers' development. *Teachers and Teaching: Theory and practice*, 10(3). DOI: 10.1080/1354060042000204388

Gonzalez-Franco, M., Bellido, A. I., Blom, K. J., Slater, M. & Rodrigues-Fornells, A. 2016. The Neurological Traces of Look-Alike Avatars. *Frontiers in Human Neuroscience*, 10: 392.. http://journal.frontiersin.org/article/10.3389/fnhum.2016.00392/full RD 2017/05/31/19:10:36

Gramsci, A. 1971. *Selections from the Prison Notebooks*. New York: International Publishers.

Graziano, M. S. A. & Kastner, S. 2011. Human consciousness and its relationship to social neuroscience: A novel hypothesis. Cognitive Neuroscience *Current Debates, Research*

& Reports, 2(2).

Graziano, M. S. A. & Webb, T. W. 2015. The attention schema theory: A mechanistic account of subjective awareness. *Frontiers in Psychology*, 6(500).

Graziano, M. S. A. & Igelström, K. M. 2017. The inferior parietal lobule and temporoparietal junction: A network perspective. *Neuropsychologia,* 105: 70-83.

Graziano, M. 2017. The Attention Schema Theory: A Foundation for Engineering Artificial Consciousness. *Frontiers* in Robotics and AI*,* 4(60): 1-9.

Grazziano, M., Guterstam, A. & Branden, J. 2019. Toward a standard model of consciousness: Reconciling the attention schema, global workspace, higher-order thought, and illusionist theories. *Cognitive Neuropsychology,* 1-18. https://doi.org/10.1080/02643294.2019.1670630

Green, P. 2017. Cognitive prototypes and narrative thinking. Available at: https://www.academia.edu/4637783/Cognitive_prototypes_and_narrative_thinking

Grossberg, L. 1986. On Postmodernism and Articulation: An interview with Stuart Hall. *Journal of Communication Inquiry,* 10(2): 45-60.

Hall, S. 1973. *Encoding and Decoding in the Television Discourse.* Birmingham: Centre for Cultural Studies, University of Birmingham.

Hall, S. 1974. Marx's Notes on Method: A 'Reading' of the '1857 Introduction'. *Cultural Studies*, 6: 132-171.

Hall, S. 1980. Encoding / Decoding. In D. Hall, A. Hobson, A. Lowe & P. Willis (Eds.). *Culture, Media, Language: Working Papers in Cultural Studies*, 1972–79. London: Hutchinson.

Hall, S. 1983. *Cultural Studies*. Durham, NC: Duke University Press.

Hall, S. 1997. *Representation: Cultural representations and signifying practices.* Thousand Oaks, CA: Sage in association with the Open University.

Hall, S. 2001. Foucault: Power, knowledge and discourse. In M. Wetherell, S. Taylor, S. J. Yates & J. Simeon, *Discourse Theory and Practice: A reader*. Thousand Oaks, CA: Sage in association with the Open University.

Hall, S., Morley, D. & Chen, K-H. 1996. *Stuart Hall: Critical dialogues in cultural studies*. London: Routledge.

Hameroff, S. 2013. VIDEO *Quantum Cognition and Brain Microtubules*. https://www.youtube.com/watch?v=Mm6Mt9BoZ_M&list=PLDIV_ZG3ALGG_pFJS 1SZ32eQT3_K2ywkg&inde x=5 RD 2017/06/16/20:09:27

Haraway, D. A. 1985. Cyborg Manifesto: Science, Technology, and Socialist-Feminism. Socialist Review 80. *https://www.researchgate.net/publication/244954842_A_Cyborg_Manifesto_Science_ Technology_and_Socialist-Feminism_in_the_Late_Twentieth_Century*

Haraway, D. 1988. Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 14(3): 575-599.

Haraway, D. 1989. *Primate Visions: Gender, Race, and Nature in the World of Modern Science.* London: Psychology Press.

Haraway, D. 1991. *Simians, cyborgs, and women*. London: Free Association Books.

Heckler, S. 2009. *Landscape, Process and Power Re-evaluating Traditional Environmental Knowledge*. New York: Berghahn Books.

Herman, D. 2007. Storytelling and the Sciences of Mind: Cognitive Narratology, Discursive Psychology, and Narratives in Face-to-Face Interaction. *Narrative,* 15(3): 306-334.

Herman, D. 2013a. Cognitive Narratology. In P. Hühn et al. (Eds.), *The living handbook of narratology.* Hamburg: Hamburg University Press http://wikis.sub.uni-hamburg.de/lhn/index.php/Cognitive_Narratology RD 2017/06/13/20:43:21

Herman, D. 2013b. *Emerging Genres Symposium Keynote Speech* [Video] https://www.youtube.com/watch?v=lzzhFYDk4Gw RD 2017/06/13/22:36:56

Herman, D. 2017. Animal Minds across Discourse Domains. In M. Burke & E. T. Troscianko (Eds.), *Cognitive Literary Science: Dialogues between Literature and Cognition*. New York: Oxford University Press: 195-218.

Hillis, K. 2009. From Capital to Karma: James Cameron's Avatar. *Project MUSE Postmodern Culture*, 19(3). http://muse.jhu.edu.i.ezproxy.nypl.org/article/392210 RD 2017/06/26/22:31:21

Hogan, P. 1999. Revolution and Despair: Allegories of Nation and Class in Patrick Hogan's 'Camps on the Hearthstone'. *The Canadian Journal of Irish Studies*, 25(1/2): 179-201.

Hogan, P. 2001. *The Culture of Conformism*: *Understanding Social Dissent*. Durham, NC: Duke University Press. http://0-reader.dukeupress.edu.oasis.unisa.ac.za/the-culture-of-conformism/71? ajax RD 2017/06/26/23:41:16

Hogan, P. 2003. *The Mind and its Stories: Narrative Universals and Human Emotion.* Cambridge: Cambridge University Press.

Hogan, P. 2004. *Empire and Poetic Voice: Cognitive and Cultural Studies of Literary Tradition and Colonialism*. New York: State University of New York Press https://muse.jhu.edu/book/4762 RD 2017/06/28/21:18:28

Hogan, P. 2005. Authors, Subjects, Personalities, Agents. In T. Grodal, B. Larsen & I. Thorving Laursen (Eds.), *Visual authorship: Creativity and intentionality in media*. Copenhagen:Museum Tusculanum Press, University of Copenhagen.

Hogan, P. 2006. A Cognitive Model of Cross-Cultural Literary Influence. In G. Lindberg-Wada (Ed.), *Studying Transcultural Literary History*. Berlin: Walter de Gruyter: 255-264.

Hogan, P. 2009. *The Mind and its Stories, Narrative Universals and Human Emotion*. Cambridge: Cambridge University Press.

Hogan, P. 2011. *Affective Narratology: The Emotional Structure of Stories*. Lincoln, NE: University of Nebraska Press.

Hogan, P.C. & Aldama, F. L. 2014. *Conversations on Cognitive Cultural Studies: Literature, Language, and Aesthetics* Columbus, OH: Ohio State University Press.

Hogan, P. C. 2015. The Psychology of Colonialism and Postcolonialism: Cognitive Approaches to Identity and Empathy. In L. Zunshine (Ed.), The Oxford Handbook of Cognitive Literary Studies. New York: Oxford University Press.

Horkheimer, M. 1972. *Critical Theory: Selected Essays.* A&C Black

Horn, J. & Eller, C. 2009. Avatar director James Cameron as cinema prophet: Moving a mountain is nothing. *Hero Complex Los Angeles Times*. Nov. 15. http://herocomplex.latimes.com/uncategorized/inside-a-dark-mixing-stage-at-20th-century-fox-a-few-weeks-ago-writer-director-james-cameron-surrounded-by-nearly-a-dozen-c/ RD 2017/06/22/19:22:06

Huang, M. 2009. The Neuroscience of Art, *Stanford Journal of Neuroscience,* 2(1). https://web.stanford.edu/group/co-sign/Huang.pdf RD 2017/01/26/17:05

Hughey, M. 2014. *The White Savior Film: Content, Critics, and Consumption*. Philadelphia, PE: Temple University Press.

Hutton, N. 2010. The Neuroscience of Avatar. *The Beautiful Brain* http://thebeautifulbrain.com/2010/01/the-neuroscience-of-avatar/ RD 2017/05/31/15:15:17

Jenkins, H. 2007. *Transmedia: Storytelling 101*. Columbia, SC: USC Press.

Jenks, C. 1995. *Visual Culture.* London: Psychology Press.

Johnson, S. L., Hritz, A. C., Royer, C. E. & Blume, J. 2016. When empathy bites back: Cautionary tales from neuroscience for capital sentencing. *Fordham Law Review*, 85(2).

Available at: https://ir.lawnet.fordham.edu/flr/vol85/iss2/9

Kellner, D. 2003. *Media Culture: Cultural Studies, Identity and Politics Between the Modern and the Post-modern*. London: Routledge.

Keysers, C. & Gazzola, V. 2014. Dissociating the Ability and Propensity for Empathy. *Trends in Cognitive Sciences*, 18(4): 163-166.

Koene, R. 2014. *The Neuroscience Era: From neuroprostheses to full emulation of the brain and towards Avatar C*. [Video]. Available at: http://2045.com/news/33416.html RD 2017/05/31/23:03:07.

Krajewska, A. 2014. Bioculturalism, simulation and satire: The case of S1m One. Doctoral dissertation, University of South Africa, Pretoria. http://hdl.handle.net/ 10500/19614

Kurzweil, R. 2005. *The Singularity Is Near: When Humans Transcend Biology*. New York: Viking Press.

Libbey, D. [S.a.]. Avatar 2: What we know so far. Available at: https://www.cinemablend.com/new/Avatar-2-What-We-Know-So-Far-42507.html

Literary Analysis. 2009. *Movie Review: "Avatar"*. Available at: https://literaryanalysis.net/2009/12/19/movie-review-avatar/ RD 2017/06/25/20:40:37

Louchart, S. & Aylett, R. [S.a.]. *Towards a narrative theory of Virtual Reality*. Centre for Virtual Environments, University of Salford. Available at: http://www.macs.hw.ac.uk/~ruth/Papers/narrative/VRTowardsNarrativeTheory.pdf RD 2017/01/25/17:49.

Lynch, M. & Haney, C. 2011. Looking Across the Empathic Divide: Racialized Decision Making on the Capital Jury. *Michigan State Law Review*, 2011: 573-590.

Lyubansky, M. 2009. *The racial politics of Avatar*. Available at: https://www.psychologytoday.com/us/blog/between-the-lines/200912/the-racial-politics-avatar

Madrigal, A. 2008. How to Use Neuroscience to Become Your Avatar. Available at: https://www.wired.com/2008/12/vr-goggles-and/ RD 2017/05/31/15:32:02

Madzoski, V. 2013. *The dialectics of care and confinement.* New York: Atropos Press.

Marks-Tarlow, T. 2010. The Fractal Self at Play. *American Journal of Play,* 3(1): 31-62. Available at: http://www.journalofplay.org/sites/www.journalofplay.org/files/pdf-articles/3-1-article-fractal-self-at-play.pdf RD 2017/07/08/19:48:40

Mayton, J. 2010. Why do Egyptians love Avatar? [Blog] Available at: https://www.theguardian.com/commentisfree/2010/mar/11/egypt-avatar-palestine-middle-east

Menand, L. 2014. The De Man Case. *The New Yorker,* March 2014 Available at: http://www.newyorker.com/magazine/2014/03/24/the-de-man-case   RD 2017/07/02/22:53:27

Merzenich, M. M. & Jenkins, W. M. 1995. Cortical plasticity, learning, and learning dysfunction. In B. Julesz & I. Kovacs (Eds.), *Maturational Windows and Adult Cortical Plasticity*. Nashville, TE: Westview Press: 247–271.

Monbiot, G. 2010. Avatar half-tells a story we would all prefer to forget. Available at: https://www.alternet.org/2010/01/avatar_half

tells_a_story_we_would_all_prefer_to_forget/

Mukhopadhyay, A. 2012. God Particle to Consciousness Life-science, Neuroscience and Nonlocal Science Hold the Key. *Science and Spiritual Quest Conference, Bangalore, India,* 108-123. https://www.researchgate.net/publication/ 280057158_God_Particle_to_Consciousness_Life- science_Neuroscience_and_Nonlocal_Science_Hold_the_Key RD 2017/07/08/19:16:31

Myrsiades, L. (Ed.). 2006. *Cognitive Shakespeare: Criticism and Theory in the Age of Neuroscience.* Baltimore, MA: The Johns Hopkins University Press. Available at: http://www.jstor.org/ stable/25115323 RD 05/07/2017/20:53

Neath, I. & Surprenant, A. M. 2003. *Human memory: An introduction to research, data, and theory*. Belmont, CA: Wadsworth.

Nerd Vault. 2016. Aliens [Video] Bonus Feature: Interview with James Cameron. Available at: https://www.youtube.com/watch?v=ASEcBT8BWc8 RD 2017/06/22/23:06:41

Nesbitt, J. 2016. Deactivating Feminism: Sigourney Weaver, James Cameron, and Avatar. *Film & History: An Interdisciplinary Journal*, 46(1 Summer),

Neural-Prosthetic Systems Laboratory. 2013. *Shenoy Lab*, Stanford. Available at: https://web.stanford.edu/~shenoy/GroupNewsArticles.htm RD 2017/07/05/20:23:57

Noske, C. 2013. David Herman: Storytelling and the Sciences of Mind. *COLLOQUY text*

theory critique, 28: 81-86. Cambridge, MA: MIT Press.

Oxenham, S. 2016. *Thousands of fMRI Brain Studies in Doubt Due to Software Flaws*, New Scientist (July 18). Available at: https://www.newscientist.com/article/2097734-thousands-of-fmri-brain-studies-in-doubt-due-to-software-flaws/

Penrose, R. 2014. Forbidden crystal symmetry in mathematics and architecture. [Video] Available at: https://www.youtube.com/watch?v=th3YMEamzmw RD 2017/06/17/19:27:10

Perkins, R. 2015. Brain prosthesis aims to provide breakthrough for people struggling with memory loss. *USC News.* Available at: https://news.usc.edu/86658/new-device-aims-to-help-people-struggling-with-memory-loss/ RD 2017/06/26/21:03:04

Petkova, V. & Ehrsson, H. H. 2008. If I Were You: Perceptual Illusion of Body Swapping. *PLoS ONE,* 3(12): e3832. Available at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0003832 RD 2017/05/31/15:35:57

Pfeiffer, C. 2015. Multisensory Spatial Mechanisms of the Bodily Self and Social Cognition: A Commentary on Vittorio Gallese and Valentina Cuccio. In T. Metzinger & J. M. Windt (Eds). *Open MIND:* 14(C). Frankfurt am Main: MIND Group. doi: 10.15502/9783958570450

Phillips, T. 2010. Avatar director James Cameron joins Amazon tribe's fight to halt giant dam. Available at: https://www.theguardian.com/world/2010/apr/18/avatar-james-cameron-brazil-dam

Piaget, J. 1952. *The Origins of Intelligence in Children*. New York: International Universities Press.

Pickering, M. 2008. *Research Methods for Cultural Studies*. Edinburgh: Edinburgh University Press.

Pinker, S. 2011. *The better angels of our nature: Why violence has declined*. New York: Viking Penguin.

Pop, D. 2009. The Double Mirror in James Cameron's Avatar: Philosophy, Ecology, Ideology and Ontology on Pandora. *Ekphrasis*, 1: 23–51.

Premack, D. & Woodruff, G. 1978. Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*, 1(4): 515-526 DOI: 10.1017/S0140525X00076512

Purse, L. 2011. Narrative and the action film. In L. Purse (Ed.), *Contemporary Action Cinema*. Edinburgh: Edinburgh University Press.

Rabinow, P. & Rose, N. (Eds.). 2003. *The Essential Foucault: Selections from Essential Works of Foucault, 1954-1984*. New York: The New Press.

Ramachandran, V. S. 2002. *Encyclopedia of the Human Brain*. San Diego, CA: Academic Press.

Ramachandran, V. S. 2003. *The Emerging Mind*. London: BBC/Profile Books.

Ramachandran, V. S. 2004. *A Brief Tour of Human Consciousness: From Impostor Poodles to Purple Numbers*. New York: Pi Press.

Ramachandran, V. S. 2011. *The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human*. New York: W. W. Norton & Company.

Ramachandran, V. S. & Blakeslee, S. 1998. *Phantoms in the Brain*. New York: William Morrow.

Ramachandran, V. S. & Hirstein, W. 1999. The Science of Art: A Neurological Theory of Aesthetic Experience. *Journal of Consciousness Studies*, 6(6-7): 15-51.

Randall, K. 2011. *Rise of Neurocinema: How Hollywood Studios Harness Your Brainwaves to Win Oscars*. Available at: https://www.fastcompany.com/1731055/rise-neurocinema-how-hollywood-studios-harness-your-brainwaves-win-oscars RD 2017/05/31/19:55:33

Renn, J. & Schemmel, M. (Eds.). 2019. *Culture and Cognition: Essays in honor of Peter Damerow*. Berlin: Max Planck Institute for the History of Science.

Richmond, S. 2016. On Learning to Fly at the Movies: Avatar and How to Train Your Dragon. *Journal of Narrative Theory*, 46(2): 254.

Rienstra, B. & Hook, D. 2006. Weakening Habermas: The undoing of communicative rationality. *Politikon: South African journal of political studies*, 33(3): 313-339. DOI: 10.1080/02589340601122950 http://eprints.lse.ac.uk/955/

Rose, G. 2007. *Visual Methodologies: An Introduction to the Interpretation of Visual Materials*. Thousand Oaks, CA: Sage.

Ruby, J. (Ed.). 1982. *A Crack in the Mirror: Reflexive Perspectives in Anthropology*.

Philadelphia, PA: University of Pennsylvania Press.

Sauer, T. 2014. *Piaget, Einstein, and the Concept of Time*. Available at: http://philsci-archive.pitt.edu/10637/1/damerow.pdf

Schuller, K. 2013. Avatar and the Movements of Neocolonial Sentimental Cinema. *ProjectMUSE Discourse,* 35(2): 177-193. Available at: https://muse.jhu.edu/article/546674 RD 2017/06/26/23:11:05

Sepp, S. 2016. Does Empathy exist in Virtual Reality? Available at: https://medium.com/usable-or-not/empathy-in-virtual-reality-38f1ee855cfc RD 2017/06/22/15:40:21

Shone, T. 2010. *James Cameron hates America*. Available at: https://slate.com/culture/2010/01/the-conservative-attack-on-avatar.html

Singh, A. 2010. *Avatar hit by accusations of racism*. Available at: https://www.telegraph.co.uk/culture/film/film-news/6968020/Avatar-hit-by-claims-of-racism.html

Smythies, J. R. 2002. *The Dynamic Neuron*. Cambridge, MA: MIT Press.

Sobchack, V. 2004. *Carnal Thoughts: Embodiment and Moving Image Culture*. Los Angeles, CA: University of California Press.

Solso, R. 1996. *Cognition and the Visual Arts*. Cambridge, MA: MIT Press.

Sperber, D. 1996. *Explaining Culture: A Naturalistic Approach*. Oxford: Blackwell.

Stadelmann, V. 2012. Language, Cognition, Interaction, Conceptual Blending as discursive practice. Doctoral dissertation, Justus Liebig University, Gießen.

Stone-Blackburn, S. 1993. Consciousness Evolution and Early Telepathic Tales. *Science Fiction Studies*, 20(2): 241-250.

Story, J. 1998. *Cultural Theory and Popular Culture*. Upper Saddle River, NJ: Prentice Hall.

Tanke, J. 2009. *Foucault's philosophy of art: A genealogy of modernity*. New York: Continuum.

Tannen, D., Hamilton, H. E. & Schiffrin, D. (Eds.) 2015. *The Handbook of Discourse Analysi*s. Oxford: Wiley Blackwell.

Taylor, B. 2010. *Opening Pandora's Film.* Sheffield: Equinox Publishing.

TirexiHD. 2010. *Avatar – The Game HD gameplay RELOADED*. [Video]. Available at: https://www.youtube.com/watch?v=Emy24ZHxJMk RD 2017/06/22/19:52:15

Tisucká, B. 2014. The intertwinedness of forest and cultural landscapes in the context of cultural ecology. *Envigogika: Charles University E-journal for Environmental Education*, 9(1): 1-7. DOI: 10.14712/18023061.428 http:// www.envigogika.cuni.cz/

Vaes, J. & Muratore, M. 2013. Defensive Dehumanization in the Medical Practice: A Cross-Sectional Study from a Health Care Worker's Perspective. *British Journal of Social Psychology*, 52(1): 180-190.

Van Dijk, T. 1995. Aims of Critical Discourse Analysis. *Japanese Discourse,* 1: 17-27.

Velleman, J. 2007. Bodies, Selves. *American Imago*, 65(3): 405-426.

Williams, R. 1961. *The Long Revolution*. Chatto & Windus

Williams, R. 1977. *Marxism and Literature.* New York: Oxford University Press.

Wu, T. 2016. The Attention Merchants: The Epic Scramble to Get Inside Our Heads. New York: Knopf.

XboxViewTV. 2009. *James Cameron's AVATAR: The Game – Official Launch Trailer HD*. [Video] https://www.youtube.com/watch?v=xw5lV0KgW20 RD 2017/06/22/19:53:18

Yellowlees, D. J. & Hargadon, A. 2001. The Pleasures of Immersion and Engagement: Schemas, Scripts, and the Fifth Business. *Digital Creativity*, 12(3): 153-166.

Zone, R. 2012. *3-D Revolution: The History of Modern Stereoscopic Cinema*. Lexington, KY: The University Press of Kentucky.

Zunshine, L. 2006. *Why We Read Fiction: Theory of Mind and the Novel*. Columbus, OH: Ohio State University Press.

Zunshine, L. 2010. *Introduction to Cognitive Cultural Studies.* Baltimore, MA: Johns Hopkins University Press.