Implanted Time: *The Final Cut* and the Reflexive Loops of Complex Narratives

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Your life wasn't what you thought it was . . . would you live it differently?' As the taglines of *The Final Cut* indicate (IMDb), in this peculiar science fiction film the future and the past are mutually dependent. The story of the *The Final Cut* (Omar Naim, 2004) is set in the near future of a developed Western city,¹ where nanotechnologies and their applications in biomedicine have made possible the recording of all human audiovisual perception with the surgical installment of a biochip, called 'zoe-implant', in the brain of unborn foetuses. As the person is born and grows up, this biochip, entirely organic, becomes fully integrated in the brain tissue to the point that it becomes a functional part of it, 'virtually undetectable'. According to the story, most of the times the bearers of the implant are unaware, until they enter their adulthood, of this 'miraculous gift' that their parents gave them before birth. But by the time they turn 21, EYE-tech, the company that produces and distributes the zoe-implants, advises parents to reveal to their children that all their memories so far have been recorded, and will continue being recorded until the end of their lives, so that 'always and forever [their] experiences and adventures will be revisited and relished'. The implant cannot be extracted while the carrier is alive without risking severe brain damage; after death though, this biochip can be surgically removed and used as a peculiar memory stick, which, as soon as it is inserted into a specifically designed computer, makes it possible to retrieve footage from all recorded memories and to make movies out of them.

These exclusively biographical movies, called 'rememories', are publicly projected in special ceremonies dedicated to deceased implant carriers. The projection takes place in church chambers turned into projection-theatres for this purpose, while friends and relatives of the deceased constitute the audience. Made out of personal perceptual archives, the rememories not only produce a flattering post-mortem portrait of the deceased, gracing them with an honored memory, but they also promise to keep their memory literally 'alive', as the rememories will remain available for projection and viewing. However, we soon realize that it is EYE-tech that owns the footage and controls the rememories; and that through the latter, it is not really the memory of the deceased that stays alive. Rememories are rather constructed from personal memories re-experienced by a stranger: a 'cutter'.

According to the story, professional cutters edit the footage retrieved from the extracted implants and decide whether something is worth being included in the rememory or deleted. The main character of *The Final Cut*, Alan Hackman (Robin Williams),² is such a cutter, a specialized editor of rememories. Socially

alienated, he lives through the lives of others, being totally attached to his editing equipment – the ‘guillotine’, as it is ironically called in the cutters’ jargon – with the help of which he cuts and edits the bits and pieces of other fragmentary life-times. A ‘sin-eater’ as he calls himself after an ancient tradition, he has to carry all the ethical burden of his cutting decisions upon the traces that a human life leaves behind.

Placed in a science fiction context, *The Final Cut* appears as an Orwellian cinematic tale about the integration of technology and biology. The appropriation of bio-digital technologies by sinister corporations is pictured as enabling the omnipresence of surveillance to expand from public spaces to the most intimate space, that of the interior of the human body, and particularly to the center of human agency and self-control: the brain. Human agency thus seems to be in peril – as we are constantly reminded in the course of the film – but strangely, in the near-future society where the story is set, this unprecedented violation of private life is not imposed by some authoritarian regime, as it often happens in dystopian science fiction. Rather, at first it appears as socially acceptable and even desirable, since this miraculous technology is supposed to have the seemingly innocent purpose of making rememories. From this perspective, *The Final Cut*’s future speculation updates the more centralized control model of the Orwellian tradition into the current actual conditions of the contemporary globalized societies, where human life-times are recorded, uploaded and distributed (in platforms such as YouTube and Facebook) through what seems to be a ‘bottom-up’ process, starting from the users’ full complicity and desire. At the same time, *The Final Cut* points at the connections between this tendency towards increased commodification and control of ‘self- broadcasting’, and the cinematic dispositif. Modernity prescribed the merging of machine-time with human-time as an economic necessity. At the other side of Taylorism’s mechanization of the worker in the line of production, cinema also played its crucial role in the commodification of life-times, as it has been the pioneer technology of the modern shift to the capitalization of leisure, to this merging of the machine-time with the human-time (Cubitt 2004, 51). From this perspective, the idea behind *The Final Cut*’s story, that of a quasi-cinematic camera being implanted into the human brain and becoming an undetectable part of it, rendering life-time into commodity, seems like the extreme consequence of a development that started more than a century ago.

In *The Final Cut*’s world, human life-times are literally turned into commodities, implant footages that can be stored on hard disks and distributed by a corporation, for the time being serving relatively innocent rememories, but with unknown future implications. EYE-tech is pictured as exploiting the apparent people’s ‘need’ to achieve immortality by recording their ephemeral perception in lasting materials. At the same time, a web of omnipresent and distributed surveillance is being created by the implant carriers themselves, who, without intention, record all the people they encounter, with their personal thoughts and secrets, into their zoe-implants, which ultimately end up in the archives of EYE-

tech. Human life becomes a commodity wrapped into an appealing high-tech package that seems to have already seduced the individuals populating the not-so-futuristic society of *The Final Cut*.

Cyberpunk's rememory

According to *The Final Cut*'s plot, EYE-tech faces resistance by some rebellion groups of neo-punks or 'anti-zoe hippies' as they are called in the film, who organize a wide range of reaction, from protests against the corporation to 'terrorist' attacks (arsons on EYE-tech's factories). The anti-zoe hippies have also invented an 'electro-synth tattoo', made out of a particular kind of ink that interferes with the implants, 'blocking them from recording audio or video'. Part of the more radical branches of the anti-implant resistance is Alan's antagonist, Fletcher (Jim Caviezel), an ex-cutter who quit his job and decided to fight against the EYE-tech corporation. Fletcher now exerts his bitter critique on Alan, trying to shake his devotion to his guillotine. But Alan faces his work on implants with cynicism: 'I didn't invent the technology', he responds to Fletcher's accusations. 'If people didn't want it, they wouldn't buy it, Fletcher. It fulfills a human need.'

However, we soon find out that what drives Alan's devotion to the rememory industry is not cynicism but guilt. Alan carries his own sins that he would wish to erase, just as those of his clients. It is revealed that when he was young he caused the death of another boy (Louis); and the memory of this old 'sin' determined his life and his choices ever since. Now offering his clients a relief from the burden of their sins, which otherwise would taint their memory forever, Alan provides them with a decent commemoration, making out of their life-footage a coherent and taintless narrative, one which he would obviously desire for himself.

Beyond its sci-fi genre classification, *The Final Cut* seems to partake of a wider cultural tendency, the one of complex films. The film's connection with the 'complex narrative' tendency is multifaceted. One way to approach the film's complexity is through its 'puzzle' or 'mind-game' character, terms suggested to characterize contemporary forms of film narration (see Buckland 2009). Mind-game films, according to Thomas Elsaesser, often involve a series of 'tricks' or 'mind-games' that the films play with their characters but also with the viewers. They carefully prepare a 'twist' that comes to fundamentally alter the story so far, and to make it demanding re-interpretation through a different lens – as it happens in *The Final Cut*, but also in various other films, such as *The Sixth Sense* (Shyamalan, 1999), *Donnie Darko* (Kelly, 2001), *Cypher* (Natali, 2002), *Casshern* (Kiriya, 2004) and others; and IC technologies are often deployed to mediate these reflexive surprises. The narratives usually start with a hero who thinks that he has control over his life, a presupposition that soon turns out to be groundless. The heroes of mind-game films, like Alan, while observing (or manipulating) the lives of others, get to realize that their own life is also being observed. They identify with the role of the 'operator of the machine' of their life, but soon find out that in

reverse, they are being operated. Thus, *The Final Cut*'s tagline 'your life wasn't what you thought it was', could be the motto of the mind- game tendency.

The crucial 'twist' in *The Final Cut* comes when Alan accidentally discovers that he himself has a zoe-implant in his brain. This finding brings him face to face with his own cyborgization and potential exploitation by EYE-tech. He edits implants while his own implant (and, consequently, his life-time) is meant to be edited. The revelation that he is an implant carrier – something prohibited to cutters by their professional code, as the film has already informed us since the very beginning – is for Alan a shocking self-reflexive experience. So we see him smashing the mirror in which he first faces his reflection, disappearing into the city's crowd encircled by echoing voices, leaning against a wall and collapsing helplessly on the pavement. He is found confronted with his own limits, as posed by his image, his voice and his body, respectively. Alan realizes that his placement in the system is not one of an autonomous observer of others' life-times: EYE-tech's project of life-commodification includes him in its raw products. After this realization, the definite boundaries that Alan perceived as separating and protecting him from the world get instantly blurred. And the secret of the machine's (as well as of his own) existence is kept in the – somewhat ironically – dusty paper archives of a corporation that renders every single moment of his life-time into footage ready to be 'cut'.

Our analysis of *The Final Cut* as a complex film would however be incomplete if we would not take into account some special genre characteristics that reveal a continuity between the current cultural tendency of complex films and an older cultural tendency, that of cyberpunk. Such continuity is especially illuminating when the issue of agency is raised in the context of complex narratives. The characterization of *The Final Cut* as 'cyberpunk' by relevant specialized websites (like the cyberpunkreview.com) but also by commercial sites (like blockbuster.com) comes as no surprise when one takes into account its two core themes, which have also been characteristic of cyberpunk, both as a genre and a cultural movement: the merging of technology with the human body (implants and other kinds of prostheses have thrived in cyberpunk science fiction) and the resistance against the appropriation of technologies by powerful corporations, especially with the use of technology by marginal individuals or subcultures in a rather creative way (e.g. the 'electro-synth tattoos' of *The Final Cut*). The narrative imbalance of *The Final Cut*, between the 'active' pole of the anti-zoe-implant resistance and the 'passive' pole of Alan's own cyborgization, points at the same problem that was central in cyberpunk stories: it seems hard to fight against the EYE-tech's exploitation of the implants when these devices have been already implanted in the brains of those who attempt to resist. Information technologies have been internalized and the traditional locus of resistance (the subject) has been displaced. In the 1980s, cyberpunk brought together two poles: the one of the human-machine (natural-artificial, real-virtual) merging – personified into its cyborg figures – and the active pole of an anti-corporate,

subversive use of information technologies. However, these two paths seem to be contradictory: how can one use technologies to fight against their control by corporate and state interests when s/he is being invaded by technologies? Thus cyberpunk, at the dawn of the expansion of informational networks, brought to the fore a tension between technologically mediated self-reflexivity – what has been called cyberpunk's 'prosthetic consciousness' (Rawdon Wilson 1995, 242) – and agency – at least in the form of oppositional action. Being controlled at the same time s/he resists, one also has to doubt his or her own motives and means of resistance. Thus, not only in cyberpunk but also in contemporary meta- cyberpunk, complex narratives, the twist-moment, which always involves a degree of self-reflexivity is at the same time a moment of uncertainty about one's own autonomous mind-body potency. Uncertainty and ambivalence, often exacerbated to the point of paranoia, have been characteristic features of both 'psychological puzzle' films (Panek 2006) and cyberpunk stories.

On the one hand, reflexivity, especially in critical discourse, has been associated with critical reflection, realization, conscious awakening – and thus, with preparation for action or resistance. On the other hand, its long philosophical, literary but also systems theoretical background has indicated as 'reflexive' different kinds of processes, characterized by self-referential circularity creating subversive dynamics, loops and infinite regress. Both varieties of reflexivity are present in *The Final Cut*, as they have also been present in the cyberpunk genre in the 1980s. However, the second conception of reflexivity, as I will show in more detail later, becomes particularly relevant in cultural formations such as cyberpunk and complex narratives, which confront or promote an informational understanding of (human) entities and relations.

Hybrid films such as *The Final Cut* are concerned not just with the technological incarnations of information, but also, and perhaps even more, with their own ability to communicate as potentially informational entities. Through a proliferation of mise-en-abyme reflections and folds between past and future, exceeding the ones justified by technologically enabled 'time travel', these complex films are self-reflexive regarding their own cyborg nature – which has for long been underlying modern narratives, and 'make explicit, to varying degrees, the technological underpinnings of the narrative mechanism' (Cameron 2008, 25). Having incorporated in their narrative form and the mode of their production the cyborgization of subjectivity, complex narratives make the play between human and nonhuman, real (actual) and virtual, internal and external, body and mind, even more fleeting than it already was in cyberpunk. Their self- reflexivity is not restricted to the borders of their story-world (diegesis) but expands to the conditions of their own existence as narratives. Thus, complex films, as Alan Cameron puts it, 'reveal both the projection of subjectivity into the domain of technology and the projection of technology into the domain of narrative' (26).

The question of agency is raised, as in cyberpunk works, in the diegesis of *The Final Cut*. How can the agency of the diegesis be expressed in complex films,

despite their self-consciousness of their own cyborgization? In the rest of this paper, I will try to proceed towards *The Final Cut*'s answer to this question, focusing on the different levels (and varieties) of self-reflexivity that are involved in *The Final Cut*, both inside and outside the diegesis. The form of agency that *The Final Cut* points at is interwoven with its (self-)reference upon its own 'cyborg' temporality, a hybrid of narrative temporality and of the spatialized, 'modular' construction of time that the culture of the database privileges.³

Self-reference and recomposable memory

The twist of *The Final Cut*, which comes with the revelation that Alan is an implant carrier, gives a push to its main subplot to develop. Before knowing about his own implant – his ignorance is explained by the fact that his parents died before having the chance to let him know about it – Alan has just started to doubt how coherent the narrative of his own life is. The conception of himself as a sinner (except for a sin-eater) is disrupted when, in the zoe-implant footage he is currently working on, he comes across a man who looks familiar. His expressions and gestures remind him of Louis, the boy he always believed dead out of his own fault. Alan's memory and self-conception thus asks for reconfiguration, and this only gets possible with the discovery of his own implant, which has been storing all his experiences so far. Thus, unlike what would happen in more traditional cyberpunk stories, *The Final Cut*'s main character has to confront not the implant industry, but instead, himself and his past. The name of the implant suggests that Alan's entire adult life (zoe in Greek) might be seen as an implanted prosthesis. As he admits in a moment of self-collapse: 'One memory; one single incident has made me who I am.' But the validity of this memory now needs to be self-reflexively put under scrutiny.

A similarly self-reflexive contemplation of the validity of memory seems to have been the occasion that gave birth to the idea of *The Final Cut*. The film's sci-fi trope was rather the 'topping' that the director and scriptwriter, Omar Naim, used in order to enrich the concerns that emerged during his first steps in film editing, about the gap between collective and personal memory, official and unofficial (lived) history. Naim was born in 1977 in Lebanon, and *The Final Cut* has been his first feature film, which he managed to develop after submitting his script proposal to the French project 'Equinox', right after finishing film school in Boston. Naim explains: '*The Final Cut* is about editing and memory. [. . .] It's the Lebanese notion of mass memory, and people's very subjective memory and view of the world. [...] This subsequently dictates how society functions. I extrapolated that into sci-fi theory' (2004a).

Being still a student in film school and working on his documentary thesis *Grand Theater: A Tale of Beirut* (1999), based on the Lebanese Civil War, Naim came up with the idea that gave birth to *The Final Cut* when the confrontation between realism and editing became hard to handle:

I think the idea came in several different stages. First of all I was editing my documentary film at school. I was the only person in the editing room. The school had just got the first Avid so I spent nine months there and I sort of became the school's editing guy. So I was editing everyone else's movies because I had access to it. While editing my documentary it really became clear that this sort of myth of objectivity in documentaries is just myth. It's all the style and manipulating, it's drama. So that was one part of it. The second part was that I was away from my family who were on the other side of the world and I started thinking that if my life goes on like this, I'm going to start seeing them less and less. So I thought what I should do is shoot these really long interviews with my parents, like twenty-hour interviews that way I could get all their little antidotes [sic] and stories out of them and I could always watch that and enjoy their company. But I never did that because that it's [sic] not them. That would be replacing my actual memories. Fading as my memories are already. We all take pictures of each other and we all have home movies and there is a need we all have to visually preserve our lives. That combined with this realization about editing is how this idea came about. (2004b)

The Final Cut's narrative self-consciousness, which Garrett Stewart finds exceptional, characterizing *The Final Cut* as the 'most narratologically self-conscious of films' (2006, 184), seems to be springing from its maker's self-reflection as film editor on this unavoidable condition of filmmaking that editing is, and on his own personal relation – interwoven with his cultural background – to cinema's treatment of time and memory. In *The Final Cut*, the finite character of editing is coupled with an ethical questioning of the 'validity' and truthfulness of the cut. As Fletcher asserts in the film (perhaps playing the role of Naim's mouthpiece), the rememories 'distort personal history, therefore all history' and rewrite the past 'for the sake of pleasant memories'. With the fictional invention of rememories, and because of their claim to 'truth', the distortion of cutting is pushed to the extreme. The life-accounts that these commemorations produce are not only supposed to be 'real', but also final – thus unchangeable.

Modularity as a device of recuperation

The nostalgia for the pre-cut acquisition, also evident in Naim's interview, is acted out in *The Final Cut*, both diegetically (by the function of the guillotine) and formally (by the structure of the plot). The second challenge is enabled by *The Final Cut*'s own carefully implanted fallacy, the false memory presented to the spectator at the beginning of the film.

This 'one single' memory that made Alan 'who he is', the memory of Louis's lethal accident, has already been revealed to us in a flashback of – what only much later proves to be – a false memory, placed in the beginning of the film, before the opening titles.⁴ During a family visit in the countryside a summer long ago, Alan, at the age of 10, meets Louis, who asks him to join him in his play. The two kids soon get involved in an adventurous and playful exploration of the nearby area. They enter an abandoned construction in the middle of a field, and start exploring the unknown territory. Bold and adventurous, Alan is the first who

steps on a wooden plank that bridges two floors of the old construction and successfully crosses the gap, without putting much effort. On the other hand, Louis, who appears as a rather passive and hesitant follower, is scared to cross, but Alan insists pushing him to make it. So Louis attempts to cross over, but, halfway to the other side, the plank starts shaking and he loses his balance. Grabbing the edge of the opposite floor where Alan already stands, the rest of his body hanging in midair, he calls for help. But Alan stands frozen and does not reach out to catch the boy. So Louis falls down to the cement floor. Alan runs downstairs to find Louis's body lying on the floor, with a red pool of blood spreading under it. Terrified, he steps back and runs to the exit, passing in front of a wall where a few moments earlier, while he was still playing with Louis, he had engraved his name: ALAN. This scene from his childhood, the memory of this lethal accident that he unintentionally caused, haunts Alan for the rest of his life. It is the moment around which the pattern of his life unfolds in a web of guilt.

In this initial scene there is already a loop structure: a moment where the scene folds back upon itself – with the emphasis put on the name of Alan written on the wall of the warehouse, in the beginning and in the end of this interior scene. The closing of this sequence with Alan's name engraved on the wall suggests that this inscription is permanent, and will stay on the wall proving Alan's guilt. However, at this point the film deceives us; it is the inscription of the whole scene's memory that will be challenged afterwards. This is not the only case of such implanted circularity. *The Final Cut* is a film that constitutes its self-organization through a similar loop – and through a layering of 'implants'.

The main loop structure of *The Final Cut* is the one that makes the plot proceed towards the revisiting of this starting sequence. The memory of the lethal event that he accidentally caused is supposed to have made Alan 'who he is', and the biochip that he discovers in his brain will give him – at a later point in the plot – a unique opportunity to navigate through his own memory archive and revisit the incident that produced this memory. Even though according to the story Alan attempts to join the resistance of 'anti-zoe hippies' in order to block his implant's recording, his will to 'fight' his implant and resist his life-time's exploitation by EYE-tech has to rival with a personal realization: the one that the implant has the power to help him solve the mystery of his own past. Thus, blocking the implant's function with the electro-synth tattoo is not enough for him; Alan will soon attempt to access his own footage.

Managing to convince some colleagues to help him, Alan gets connected to his implant through electrodes, 'pirating' the data that the implant's camera sends to its microprocessor. Now he can really see through the camera-eye placed inside his brain. As his human eyes watch the camera's live inscription, Alan gets a view of the world through a lower-definition digital eye. The signal is directly transmitted to a guillotine placed in front of him running its editing software, and Alan has to use it in a careful and timesaving mode. He has only five minutes at his disposal, else he risks dying. He uses the touchpad to navigate back in time,

trying to arrive at the age of 10, when the crucial incident happened. He sees himself again as a boy in the mirror, he witnesses his parents' funeral, his first kiss and, while time is running out, he finally arrives at the scene at the old warehouse, where we already saw him playing with Louis, in the beginning of the film. Here the spectator, primed with a memory of this scene since the opening of *The Final Cut*, participates in the recognition of the correct scene. Alan watches again himself and the other boy sword-playing and eventually arriving at the dangerous spot, the wooden plank that bridges the opposite levels of the construction. But this time things seem slightly different: Louis appears now much more dynamic. Playing with the swords, he shouts to Alan: 'come and get me!' When Alan crosses the gap on the plank, he asks Louis to meet on the ground floor, but Louis insists on crossing too. Alan once more tries to stop him: 'No. Wait. Wait. It isn't steady anymore.' But Louis does not listen; he has already started walking on the plank, which now starts shaking. Standing in the middle of the plank, Louis screams: 'I can't move!' Then Alan tries to give him directions: 'Ok Louis, you can make it. Just a few more steps.' But Louis loses his balance. 'Grab my hand!' he shouts. Alan reaches out to grab him but it is too late; Louis falls in the void. Alan only manages to grab an amulet that Louis was wearing around his neck.

Only seven seconds are left for Alan to discover what finally happened that day. He watches himself running down the stairs and arriving wheezy at the ground floor. Time is running out and his colleagues shout at him to unplug the electrodes. But Alan does not listen; he has come to the point where he as a boy faces the body of his friend lying down on the floor. Then something unexpected happens. Alan accidentally steps over a can full of paint, the can is overturned and the red paint spreads all over the floor around Louis's body. Alan sees himself stepping back, so much absorbed under his shock and watching his shoes leaving traces on the thick red liquid that spreads underneath them, that he does not listen to the quiet coughing of Louis.

Time has run out and an electric shock throws Alan off his chair. His friends run to help him. When he finds his senses a few minutes later, he is not anymore the sin-carrier that he used to be: 'I saw him. I tried to help. I told him to turn around. But he wouldn't listen. He fell but, he was breathing . . . !', says full of relief. 'It wasn't blood. It was paint. Now I remember.'

The 'final' cut made by Alan's memory, the scene that he 'chose' to remember, might have been distorting but not definite. Assisted by his zoe-implant, Alan manages to revisit and alter this one single memory that configured his subjectivity. Thus, the huge gap at the core of his life so far gets finally bridged, not with a wooden plank but with electrodes connecting him to a bio-digital implant in his brain. Here *The Final Cut* seems to be fulfilling not only the desire of Alan for a taintless past but also, in a way, the fantasy of Naim to recuperate through recordings the living presence of his beloved ones.

Because of their decomposable and recomposable form that mimics the structure of the database, Allan Cameron has characterized complex narratives as

‘modular’. This recomposability extends to the ethical plane, especially in films with reverse temporal structure, as it creates the possibility of redemption for their characters (Cameron 2008, 35).⁵ One could argue that such a tendency towards redemption is also apparent in *The Final Cut*’s modularity. The main hero of the film edits others’ lives and finally, assisted by his implant, manages to do the same with his own life. Thus, he gets the chance to weave a life-story relieved from guilt, purified like the memories he makes for his clients. But the possibility for this ‘new’ life does not take place intentionally, or following some kind of plan. It is rather discovered, as if it had always been lying before his eyes, even though a distorting, subjective gap between the actual world and the mnemonic trace of its imprint prevented him from seeing it. Rather than consciously driving his destiny, Alan attunes his agency to the one of the plot’s ‘mind-game’, which finally offers him the reassurance that this gap can be circumscribed; that his technological prosthesis (the zoe-implant) can access and correct his mnemonic imprints, and thus restore the feedback between his existence and the world that embeds it.

Because of its crucial role in the film’s modular function, the zoe-implant technology is treated in *The Final Cut* with an underlying but profound ambivalence: despite all the moral critique that the plot communicates against the zoe-implant and its terrifying consequences regarding issues of privacy and truth distortion, in the end the implant proves to be exactly the only way left for Alan to find the truth about his own past and to feel relief in escaping from it. Although the protests against the implant and the criticism against it intensifies, making the anti-zoe protesters demand their right to ‘remember for themselves’, as we read on their placards, *The Final Cut* does not seem to doubt the value of the implant’s ‘miraculous gift’, but only the human – immoral – treatment of it, in other words, the plausibility of the cut.

The protagonist of *The Final Cut* sees through the implant that his whole life so far has been founded on a mistake, a trick of his memory. At the same time, the implant provides him with a vision of himself before the moment of his subjectification in guilt.⁶ This new vision fundamentally alters his perception of himself, his self-reflexivity, and the pieces of his life’s puzzle are finally brought together. The pre-cut footage of the zoe-implant’s biocamera is not falsified; on the contrary, it may set the carriers free from their own ‘human’ distortions. The implant provides the ability to store, retrieve and ultimately circumvent the distortions of the unconscious. It offers Alan an almost transparent experience, mediated by the objectivity of the bio-digital eye of the camera, and liberated from the subjective factors of guilt, trauma or repression.

Stewart (2006, 177) regards *The Final Cut* as the culmination but also the ‘dead end’ of a cycle of films of ‘psychotemporal transport’, or ‘recuperative time travel films’, to which he includes films such as *Johnny Mnemonic* (1995), *Minority Report* (2002), *Eternal Sunshine of the Spotless Mind* (2004) and *The Butterfly Effect* (2004). Stewart’s analysis of *The Final Cut* illuminates the allegories of the zoe-implant technology, with its ability to violate ‘the passing

present by a perversely redoubled self-presence' (161), effectuated by the biocamera's recording. But the recuperative function of the film also lies in the potential offered by the zoe-implant's digital 'backup' memory to revisit and 'correct' history, an option that in *The Final Cut* does not appear to be something more than a fulfillment of a mind-game. When, as the tagline of the movie promises, Alan is finally able to 'see everything', when he combines his human limited memory with the 'objective' machine-memory of the implant, he comes to a point of 'total reflexivity', to his own life's 'final cut'. The cracking of the film's code, the solution of its mind-game, seems to have a similar totalizing effect: the solution was part of the mind-game all along.

As Sean Cubitt writes about recent Hollywood puzzle films that he calls 'neo- baroque':

for the fictive world to present itself as coherent, it must eradicate subjectivity as the potential source of novelty. The cleanest cut is to deprive the characters of futurity by endowing them instead with a fate [. . .] the purpose of subjectivity is fulfilled at the moment in which it is absorbed entirely into the pattern of the world. (2004, 240)

Alan in *The Final Cut* could also be seen as fulfilling his fate, being at last able to 'disappear into the arabesques of spectacular coincidence' (Cubitt 2004, 244), such as those produced by an overturned can of paint. In this respect, the relieving discovery of what 'truly' happened does not seem to be creating new paths but closure in a self-fulfilled whole. It looks as if *The Final Cut* has fulfilled its plot's purpose; it extracted its own implant.

Reflexivity between the cut and the 'paste'

Modularity does not only characterize the story of *The Final Cut* and the 'recomposable' destiny of its hero, but also the structure of the plot. The opening scene – the memory of the play with Louis – is the film's own implant; it functions as a memory trace implanted by the film with the single purpose to be extracted – and subverted – later. In *The Final Cut*'s narrative puzzle, a problematic piece creates a distorted picture, and its replacement allows a different picture to appear. This ludic deception of the viewer, who, however, is given in the course of the film some 'clues' that point at the unreliability of the construction (in *The Final Cut*, such clues are the discovery of Louis's adult-double in the footage that Alan is working on, as well as the discovery that Alan is himself at the same time a cutter and an implant carrier), is not uncommon in puzzle films. Although these clues are not to be seen as fundamentally different from those in classical detective stories or film noir, the uncertainty that they introduce and the temporal restructuring that they demand and prepare/anticipate, give the film a reflexive twist that makes it more complex.

In *The Final Cut*, a multiple mind-game is being played between the film and the viewer: not only Alan has to alter the perception/interpretation of his own

life-story, but also the viewers are prompted to re-interpret the film's story. Both the self-identity of the character and the story become modifiable and modular, while the medium of such modularity appears to be digital. The implant's (digital) footage bears the marks of real-time recording, keeping track of the date, time and seconds of the inscription. It also displays the name of the carrier. The guillotine's software classifies the footage into distinct scenes, tags them with categories (for instance: 'childhood', 'puberty', 'sleep', 'career', 'fears', 'marriage', etc.). The categorization that the guillotine performs makes it easy to navigate memory, access isolated scenes and, potentially, replace them.

The function of the guillotine is imitated by *The Final Cut*'s plot structure. Like mind-game films that 'implant' clues,⁷ *The Final Cut* 'implants' an object (the false memory in the beginning) and structures its plot so that it will retrieve and revisit the implanted clue (just like the protagonist does with the help of the guillotine), in order to verify or falsify the viewer's own – subjective – inscription of it. Like Alan, the viewer will have to retrieve from his or her own memory the initial scene and compare it with the one presented towards the end of the film. *The Final Cut* thus imitates the 'modularity' of digitalization and nonlinear editing informational inscription (as binary code) of sensory input makes it spatially accessible and modifiable, altering the procedure of films' post-production. The *Final Cut*'s 'guillotine' seems to be functioning in a similar way with contemporary nonlinear editing systems (NLE), enabling the instantaneous accessing of any frame or part of the film without the need of re-editing the rest (Evans 2005, 14), with the difference that, according to the futuristic script, the source of the footage in *The Final Cut* is bio-digital. Although nonlinear editing systems do not delete ('final cut') footage and keep an archive of multiple editing versions (EDLs or edit decision lists), the narrative of *The Final Cut* appears, as we will see, as much reluctant to abandon the idea of editing as permanent distortion as it is tempted to challenge (or put into question) this idea through its diegetic and formal modularity. This oscillation resonates with *The Final Cut*'s own technical production, as the movie was shot both in film (35 mm) and in digital video (the scenes of the zoe footage) (see Naim 2004c).

The Final Cut's oscillation between the 'cut' (permanent distortion) and the 'paste' (modularity) is enhanced by its ambivalent stance towards technology. The trust to the zoe-implant's memory does not necessarily suggest a blind faith to its inscription: the latter can also be falsified as, according to the story, there are also 'defect' implants, which 'cannot distinguish what the mind sees from what the eye sees', and thus record hallucinations and dreams, instead of the input from the external environment. Rather, the film's ambivalent stance towards the technology of the implant could be seen as an expression of disbelief towards the human inscription, because of its vulnerability to the 'cut'. *The Final Cut* undermines the trust to both the 'eye' and the 'I'. It thus displays characteristics of a new version of realism in which, as Elsaesser suggests, an 'impersonal "thing" or apparatus taking my picture, or capturing an event, is a better guarantee of my existence [. . .

] than the unmediated face-to-face, likely to give rise to misunderstandings' (2009c, 4).

Distortion according to *The Final Cut* happens already at the initial point of mnemonic inscription. The film's own implant, the false memory in the beginning, has been distorting too. In this respect, narrative (as a coherent causal-logical whole on which Alan's conception was based on starting from the incident in his childhood, but also as the logical sequence of events that the viewers gradually construct) along with the human perception and consciousness, unlike the digital memory of the implant, does get affected by subjective factors such as motives, traumata, purposes, distortions. If narrative always presupposes the intervention of the human factor (Bal 1985, 26), *The Final Cut* equates this intervention with distortion and loss. Where the narrative starts, both for the film (initial scene) and for the character (the memory of himself) there is always already a selection, a cut; and in the plot's non-linear form finds expression an agency that wants to reach out to what remains unstructured, to the contingency that constitutes the condition for narrative to exist in the first place (see Simons 2008).

In *The Final Cut* the source of trauma is not the human or the machine, but a 'founding subject' that cuts what the recorded memory (which still has to be played again and subjectively relived) retains: the psychoanalytic hold onto sound (voice) and embodiment, which the cinematic over-reliance on (and over-estimation of) its mechanical means suspends (Elsaesser 2009a, 108). In *The Final Cut* we might notice that the paint's overturning is not the only revelation of the bio-implant: the implant's direct access showed Alan that he had lived his life not being enslaved by machines (guillotines or implants) but by his own persisting fantasy of omnipotence. The implant's footage suggests that he is not the final cause of his own life and misery, that he has no control over the others' death (Louis's) or life (the projects that he undertakes in his job as a cutter, attempting to grace the dead with immortality). Other factors, from the most significant to the most trivial, like that of an overturned can of paint, may change the outcome of situations.

In *The Final Cut*, as well as in narrative, 'what the eye sees' is highly dependent on 'what the mind sees'. What Alan 'cut' out of his mnemonic trace has been the powerlessness of his body (which proved unable to help Louis), the time that slipped without him managing to catch up and react, the sounds (that revealed that Louis was still alive), all in all the marks of an affective experience that would shatter his fantasy of omnipotence; a fantasy which later Alan had to retain and make it the basis of his self-conception in order to justify his (distorted) mnemonic inscription, according to which he had instigated the death of another person. What Alan's memory retained was just the sight of a red liquid spreading under his feet, which he explained as blood, deleting all the other input he had received and adequately modifying his self-conception by weaving a narrative of guilt and victimization to fit into.

Thus, the reverse and modular temporality of *The Final Cut*, which could

be considered as linear – in the mathematical and not the lay sense of linearity – ultimately emphasizes the nonlinearity of human and narrative temporality. Alan's going back to 'the scene of the crime' highlights what is no longer recoverable – Alan's life so far – rather than what can be miraculously recuperated. The two modes of temporality at play in *The Final Cut*, the one found in the plot's reversal of time and the other in the narrative's irreversibility (demonstrated by Alan's determination by the chance events and accidents of his early life) do not contrast each other, but are actually interwoven by reflexive means since the film resists both permanent distortion and linear recuperation. Reflexivity plays a crucial role in the discontinuous temporal organization of the film. As a property of complex systems, it entangles of self-reference with time.

A synthesis of narrative and database temporality: reflexivity in complex systems

It is in the field of systems theory that reflexivity has been linked to the complexity of systems. In his theory of social systems, Niklas Luhmann ascribed a central role to reflexivity. The organization of systems – their way to deal with environmental complexity by building up their own complexity – is carried through self-reference, and Luhmann defines reflexivity as one aspect of this systemic self-reference. According to him, everything that can be considered – and referred to – as a 'self', everything that can display self-reference, is composed by the triad: elements (events and actions)–processes–systems (Luhmann 1995, 447). Reflexivity is the type of self-reference that refers to the 'process' part of this triad.

Luhmann's theory refers to social systems composed by events–communications. These events are instances of self-reference, and, as long as contemporary complex films communicate through self-reference, as I would argue, they could also be thought as systems. Luhmann describes reflexivity as a process that organizes events (the elements that compose every system) in time. Reflexivity has a strong temporal character as it glues the elements of the system together, rendering it capable of evolving in time. Through reflexivity, a system makes selections (thus produces new events) based on earlier and later events (previous selections and future expectations). Thus, events (elements, singular occurrences), although contingent selections at first, re-enter into the process and differentiate the structure of a system; they create an each time new temporal sequence, by acquiring 'predictive value' and forwarding the events that are about to come. Reflexivity thus becomes a basic process of self-organization; arranging the events that compose the system in time, it generates the system's causality and makes its communication with other systems (such as the one of the viewer, in the case of films) possible. 'Therefore an observer can detect movements, follow melodies, and figure out what is going to be said' (Luhmann 1995, 451).

In this context, we may see *The Final Cut* and other complex narrative films as self-referential systems that create a temporal sequence every time they

observe themselves. 'Twists' of the plot and clues that are revisited in complex films, like the initial flashback in *The Final Cut*, are instances of self-observation and therefore self-reflexive devices: structuring the plot of the films they perform the 'time-juggling' on which complex systems (according to Luhmann) achieve their self-organization. Using these observations as singular occurrences (events) and re-placing them into the temporal sequence, complex films self-organize and create their complexity like complex systems do. Reflexive temporality does not reduce complexity but rather makes it possible:

Systems based on events need a more complex pattern of time. For them, time cannot be given as an irreversibility alone. Events [the systems' composing elements] are happenings which make a difference between a 'before' and a 'thereafter'. They can be identified and observed, anticipated and remembered, only as such a difference. Their presence is a co-presence of the before and the thereafter. They have, therefore, to present time within time and to reconstruct temporality in terms of a shifting presence which has its quality as presence only owing to the double horizons of past and future which accompany the presence on its way into the future. On this basis conscious time-binding can develop. (Luhmann 1986, 181–2)

The analeptic and proleptic (to use Genette's terminology) qualities of complex narratives give way to the presentation and presence of time. According to this systemic model, narrative's reflexive structuring does not so only suggest a 'spatialization of time' but also a temporalization of space, and thus a reflection upon time as difference between past, present and future.

The duality of horizons doubles as soon as we think of a future present or a past present, both of which have their own future and their own past. The temporal structure of time repeats itself within itself, and only this reflexivity makes it possible to renounce a stable and enduring presence. (Luhmann 1986, 182)

Such reflexive and nonlinear play in contemporary complex films does not suggest a cancelling out of the arrow of time. Rather, it is a self-reflexive (and self-conscious) projection of how time and meaning are gradually constituted in a complex self-referential process.

As viewers of *The Final Cut*, we do not only realize the reverse temporal movement of the narration when this becomes – diegetically – enabled by the machine, the guillotine.⁸ Rather, the function of the guillotine can be considered a self-referential device of the film, which, through a diegetic mise-en-abyme, communicates its own structure: it is not only the implant that within the diegesis navigates through time, but the plot itself is used as a time-juggling but also time-generating machine. So, even if the function of the implant in the narrative with its direct recording of lived experience might be one that leaves no 'time of affective deferral within which to maneuver original impression into psychic trace, event into memory, no time for the willful construction of mental temporality per se'

(Stewart 2006, 189),⁹ the recruitment of the implant as a narrational device does not redeem time but observes it, creating a temporalized experience. The narrative of *The Final Cut* turns the medium of the guillotine into a counterpart of its own complex organization.

But let us have a closer look at the film's non-linear temporality at the microlevel of scene constitution. Towards the end of *The Final Cut*, a succession of reflexive framings disorients us just before the film's own 'final cut': as Alan runs to save his life from Fletcher who wants to use his implant against EYE-tech, a quick montage crosscuts two different kinds of point of view (POV) shots: shots representing Alan's visual inscription, stylistically assimilated into the visual style of the rest of the film, and shots reproducing the – visual and auditory – inscription of his implant (the recording not only appears as having the colder colors of video but it has actually been shot in digital video). A temporal layering is created (culminating at the point of Alan's death) through this kind of juxtaposition of subjective, 'filmic' POVs from the character's present, and 'digital' POVs that have already become past and are being watched by someone else, at a later point in the narrative's progression. Previous scenes of the film using the latter kind of POVs have primed us to consider them as images from zoe-implant footage, when it has been 'read' by the guillotine. Thus, the temporal as well as the subjective indexicality of this crosscut scene is dubious as we cannot be certain whether it is only Alan who is looking: it could be Alan, but then his vision could not have the marking signs of the implant's recording (texture of image but also track of time and name), so it is likely that someone else looks through Alan's eyes; and this look could only come from a later point in time. A cut to the next scene makes more explicit the temporal layering of the previous chasing sequence. Now, obviously after Alan's death, we see Fletcher watching the footage of Alan's implant. As Fletcher looks absorbed in editing the implant, the camera moves behind him to include, him too, in a mise-en-abyme of gazes. In these two succeeding scenes, *The Final Cut* makes use of 'traditional' reflexive techniques constituted from 'various mise-en-abyme-constructions [that] resemble looks into the mirror' (Elsaesser and Hagener 2010, 74). But this technical reflexivity, the creative possibilities of which have perhaps been exhausted by the modernist cinema of the past – and especially the European avant-garde filmmaking of the 1960s and 1970s – is here intertwined with a time- juggling that juxtaposes past, present and future. It is not just the framing of gazes but the temporal constitution of the scene that produces this vertigo.

The Final Cut certainly does – though somewhat implicitly – prompt the spectators to become aware of the conditions of the film's making. The narrative is intentionally self-referential about issues such as the reality that films conceal, the selections that they make, the 'cuts' through which they proceed. *The Final Cut*, as already discussed, attempts rather consciously to reflect on the procedure of filmmaking as 'cutting' of recorded footage that used to be live, and making out of it coherent – but inevitably distorted – stories. This type of self-reflexivity could

be interpreted as the result of the filmmaker's subjective contemplation over his relationship with the theme and the medium. It is with such a self-conscious/self-expository move which adequately shapes the structure and the style of a text (with the aid of specific techniques) and has a corresponding effect upon the reader-decoder (suspending his/her immersion to the story and adding multiple layers of signification), that a text's 'reflexivity' has been associated in social theory, anthropology and also in film studies (see Polan 1974; Ruby 1988; Ashmore 1989; Stam 1992).

However, the reflexivity involved in *The Final Cut*'s complex narrative is a process that emerges from the text and not a message to be transmitted and decoded through it. Within this line of reasoning, reflexivity also differs from a celebration, in a postmodernist and poststructuralist vein, of the groundlessness of meaning and of the constant deferral of signification. The dynamic reflexivity of *The Final Cut*'s complex structure both completes and exceeds the self-referential accounts of its maker(s), and involves the spectator into a different type of meaning-making. The narrative mediation of self-reference in through the bio-implant and its counterparts, the 'implants' used by the film narration, opts for a conception of reflexivity not as the artistic effect of disillusioned self-reflection, or as solely a technical employment of mise-en-abyme framings, but as a dynamic process, which emerges from the play between modular (digital) and narrative temporality.

The film's reflexivity is one of its backward and forward time-loops, distinguished both at the level of the story and at the one of the plot, which, as Luhmann's systems theory shows, suggest alternative views of what has already taken or will take place, and engage the viewer in a procedure of dynamic meaning-making. These loops present rather straightforwardly the film's temporal self-organization. The way the diegesis restructures itself through self-reflexive observations demonstrates an emergent agency that is not anthropomorphic but systemic. Thus, the film's self-awareness does not precede its temporal organization, but is rather intertwined with it. The process of the narrative's self-constitution is emphasized and observed through implants that continuously disrupt linear types of organization. The 'cut' – and therefore – the film's own narrational constitution, can be observed only through participation to a reflexive temporality.

In such systemic observation lies the model of agency that complex narratives put forth. In *The Final Cut*, agency is expressed not through the parallel quest of the protagonist and the viewer to expose the recording of his implant and find the 'truth' – a quest that could be seen as a performance in *The Final Cut* of a liberal kind of agency that cyberpunk was also accused of, an agency associated with the desire to stay in control (see Nixon 1992; Bukatman 1993; Balsamo 1996; Silvio 1999) – but through the reflection upon the passage of time, which cannot be recuperated, but only a posteriori observed through another.

In the last scene of *The Final Cut*, as Fletcher edits the footage of Alan's

implant, he watches on the screen of his computer the reflection of Alan in the mirror. Fletcher promises to the reflection of an already dead Alan that the latter's life will finally 'mean something' (as Fletcher intends to use Alan's implant to trap a 'big head' of EYE-tech in a moral scandal, and thus harm the company's profile). The film's ending (or 'final cut') comes with one more mind-game right before the closing credits. To what appears to be a POV shot through Fletcher's eyes on Alan's face in the mirror (and now on the screen of Fletcher's computer), the reflection of Alan leaves the frame, suggesting that it is not Alan anymore looking at his reflection, nor Fletcher looking through Alan's eyes. At the point that the narrative ends, the mirror/screen waits for us, the viewers, to fill it not with our reflection but with our own mnemonic records. This 'mind-game' is of course not convincing as closure; it has rather been *The Final Cut*'s communicative condition all along, if we consider the false memories of the character. Narrative reflexivity, as a temporalized way of self-reference, is much more than an agent of self-fulfilment and closure. Only now it is the viewer who is more directly invited to this game. Self-reflexivity thus takes us into the loop, where (narrative) closure is no longer possible. As the German DVD title of the film suggests, "Dein Tod ist erst der Anfang" (the end is only the beginning).

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Notes

1. The shooting of *The Final Cut* was done in Vancouver, Canada.
2. 'Hakman' literally means 'cutter' in German.
3. For the meaning of modularity in the new media context see Manovich 2001, 30.
4. The faded sepia colors of the scene, as well as its placement at the beginning of the film before the credits, give some indications that it might be temporally situated in the past. It thus temporally anchors the film to the past and prepares the viewer for a return to it.
5. For a more general ethical critique of complex narratives see also Cubitt 2004 and Cubitt and Cameron 2009.
6. The moment when Alan runs away from the 'scene of the crime' and we watch him passing in front of the wall where his name is written with big capital letters, could be seen from a Lacanian perspective as the 'symbolic birth' of the character.
7. Lars von Trier first associated 'mind-games' with the 'lookies' (a sort of hidden clues) contained in his film *The Boss of it All* (2006), as Elsaesser notes in 'The Mind-Game Film' (2009b).
8. For the same reason Charles Ramirez Berg excludes from his taxonomy of alternative plots science fiction films such as *The Matrix*, because he finds that their nonlinear temporality is genre-dependent, and fundamentally remains a linear quest for truth (or 'for deciphering the mystery') by a single protagonist, without allowing for alternative

interpretations (2006, 11–12).

9. This digital recording eliminates, according to Stewart, the time-lapse characteristic of filmic temporality (linked to the virtualization of the present, according to Deleuze), leading to the alienation of experience and self-consciousness.

References

Ashmore, Malcolm. 1989. *The reflexive thesis: Wrighting sociology of scientific knowledge*. Chicago: Chicago University Press.

Bal, Mieke. 1985. *Narratology: Introduction to the theory of narrative*. Toronto: University of Toronto Press.

Balsamo, Anne. 1996. *Technologies of the gendered body: Reading cyborg women*. Durham, NC: Duke University Press.

Buckland, Warren. 2009. Introduction: Puzzle plots. In *Puzzle films: Complex storytelling in contemporary cinema*, ed. Warren Buckland. Chichester: Blackwell.

Bukatman, Scott. 1993. *Terminal identity: The virtual subject in post-modern science fiction*. Durham, NC: Duke University Press.

Cameron, Allan. 2008. *Modular narratives in contemporary cinema*. Houndmills: Palgrave Macmillan.

Cubitt, Sean. 2004. *The cinema effect*. Cambridge, MA: MIT Press.

Cubitt, Sean, and Allan Cameron. 2009. Infernal Affairs and the ethics of complex narratives. In *Puzzle films: Complex storytelling in contemporary cinema*, ed. Warren Buckland. Chichester: Blackwell.

Elsaesser, Thomas. 2009a. Freud as media theorist: Mystic writing-pads and the matter of memory. *Screen* 50, no. 1: 100–13.

———. 2009b. The mind-game film. In *Puzzle films: Complex storytelling in contemporary cinema*, ed. Warren Buckland. Chichester: Blackwell.

———. 2009c. World cinema: Realism, evidence, presence. In *Realism and the audiovisual media*, ed. Lucia Nagib and Cecilia Melo. Houndmills: Palgrave Macmillan.

Elsaesser, Thomas, and Malte Hagener. 2010. *Film theory: An introduction through the senses*. New York: Routledge.

Evans, Russell. 2005. *Practical DV filmmaking*. Burlington, MA: Focal Press.
IMDb, The Internet Movie Database. Taglines of the movie *The Final Cut*.
<http://www.imdb.com/title/tt0364343/taglines>

Luhmann, Niklas. 1986. The autopoiesis of social systems. In *Sociocybernetic paradoxes: Observation, control and evolution of self-steering systems*, ed. Felix Geyer and Johannes van der Zouwen, 181–2. London: Sage.

———. 1995. *Social systems*. Stanford, CA: Stanford University Press, Originally published in German in 1984.

Manovich, Lev. 2001. *The language of new media*. Cambridge, MA: MIT Press.

Naim, Omar. 2004a. Interview at the Daily Star of Lebanon. Reproduced in Robin Williams' fansite. <http://www.robin-williams.net/interviews/finalcut/naim.php>

———. 2004b. Interview with Jim Caviezel to Sean Clark. <http://www.dreadcentral.com/interviews/naim-omar-caviezel-jim-the-final-cut>

———. 2004c. Interview to Michael J. Lee for radiofree.com, October 12. http://movies.radiofree.comx/interviews/thefinal_omar_naim.shtml

Nixon, Nicola. 1992. Cyberpunk: Preparing the ground for revolution or keeping the boys satisfied? *Science-Fiction Studies* 19, no. 2: 219–35.

Panek, Elliot. 2006. The poet and the detective: Defining the psychological puzzle film. *Film Criticism* 31, nos. 1–2: 62–88.

Polan, Dana B. 1974. Brecht and the politics of self-reflexive cinema. *Jump Cut: A Review of Contemporary Media* 1: 29.

Ramirez Berg, Charles. 2006. A taxonomy of alternative plots in recent films: Classifying the 'Tarantino effect'. *Film Criticism* 31, nos. 1–2: 5–61.

Rawdon, Wilson, R. 1995. Cyber(body)parts: Prosthetic consciousness. In *Cyberspace/-cyberbodies/cyberpunk: Cultures of technological embodiment*, ed. Mike Featherstone and Roger Burrows. London: Sage.

Ruby, Jay. 2005. The image mirrored: Reflexivity and the documentary film. In *New challenges for documentary*, ed. Alan Rosenthal and John Corner. Manchester: Manchester University Press, First edition 1988, University of California Press.

Silvio, Carl. 1999. Refiguring the radical cyborg in Mamoru Oshii's 'Ghost in the Shell'. *Science Fiction Studies* 26, no. 1: 54–72.

Simons, Jan. 2008. Complex narratives. *New Review of Film and Television Studies* 6, no. 2: 111–26.

Stam, Robert. 1992. *Reflexivity in film and literature: From Don Quixote to Jean-Luc Godard*. New York: Columbia University Press.

Stewart, Garrett. 2006. Vitagraphic time. *Biography* 29, no. 1: 159–192. (See also the chapter ‘VR from cinnemomics to digitime’ in Stewart, *Framed time: Toward a postfilmic cinema*, 164–203. Chicago: University of Chicago Press, 2007)