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Kinesic constructions
An aesthetic analysis of movement and performance in 3D animation

In animation the issue of movement is central to any discussion of its nature, irrespective of its form, style or process of creation. As an animator, Norman McLaren believed "the most important thing in film is motion, movement" (in Bendazzi, 1994:117), whilst Wells describes animated films as "the artificial creation of the illusion of movement in inanimate lines and forms" (1998:10). Movement is of primary concern in this simple definition and in earlier critical analyses of animation, Sergei Eisenstein "recognised 'if it moves, *then* it's alive'" [italics in original] (Leyda, 1988:54 quoted in Wells, 1998:14). This paper considers the concept of movement in animation films expressed in the kinesic performance of the character(s).

The analysis focuses on movement in computer generated animation, specifically *Final Fantasy: The Spirits Within* (2001: dir. Hironobu Sakaguchi), and *Final Fantasy VII Advent Children*, (2005: dir. Tetsuya Nomura and Takeshi Nozue) and will draw on the work of Gunther Kress and Theo van Leeuwen. It should be noted that this paper is an exploration of the social semiotics grammar of Kress and van Leeuwen, as applied specifically to movement. This latter aspect is somewhat neglected in their work and the analysis in this paper highlights the applicability of their concepts to the analysis of movement in animation.

I have chosen the title of this paper to specifically echo this focus on movement. The word kinesics comes from the Greek *kinēsis* or movement and is the study of "body movement and its contribution to communication" (OCD, 1982). The focus is therefore not only placed on movements associated with the body, appreciably differentiated from movement as performance or as gesture, but also how movement itself can contribute to communication or meaning-making. The problem, as highlighted in this paper, is that movement slips between and into these other concepts and becomes a part of them and as such, becomes a difficult element to analyse. Discussions of animation tend to blend movement with these other concepts (of gesture, performance, etc.) and although movement is inherent in these concepts, they do not necessitate movement, nor are they made up of movement alone. Movement is therefore subjectively transformed in relation to other concepts. So although Wells does state that "animated motion carries with it implied 'meaning', sometimes metaphoric or symbolic", he does also aver that "motion could be simply 'blocking', i.e. the movement from A to B" (Wells, 2009)[1]. It is these movements of the body "from A to B" that this paper considers as a starting point.

Since the advent of the moving image, theorists have repeatedly explored the nature of the "real" in film and its relationship to indexical reality and the photoreal (see Arnheim, 1966; Bazin, 1971; Earle, 1968; Kracauer, 1960 and Lotman, 1976). With the increase of digital technologies, the issue of what is "real" in the construction of a visual narrative becomes even more complex, highlighting nuanced understandings of how reality is interpreted from the screen (see Keane, 2007; Manovich, 2001 and Elizabeth Menon, Damian Sutton and Jenna Ng all in Sutton et al., 2007). The central theme of many of these discussions tends to focus on the relationship to the photograph and such elements as lighting, colour, and composition all static aesthetic elements; movement as an indicator of reality is seldom the focus of the argument. However, Metz's (1974) seminal discussion on Film Language not only considers the issue of

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[1] Personal correspondence with Paul Wells 2009

reality in the cinema from a semiotic perspective but, drawing on the work of earlier theorists, comes to the conclusion that the "secret" of the motion picture is the injection of motion into the unreality of the (static) image, thus foregrounding movement as an important factor in the interpretation of the "real". In an attempt to create an alternative theory to explain the viewer's response to the "unreality" on and of the screen, Prince's discussion of *Perceptual Realism* highlights movement as one of the three most important cues "to create a synthetic reality that looks as real as possible" (1994:33). Motion therefore plays a vital role in determining the audience's sense of the "real" in the world of the imagination.

In the moving image context however, movement can be defined from a number of different perspectives. Zettl (1999) uses the concepts Primary, Secondary and Tertiary Motion to respectively isolate movement in front of the camera, movement of the camera and movement created through the process of editing the images together. Primary motion focuses on movement of the objects in front of the lens, or in the case of animation, the illusion of movement perceived as having been captured in front of a lens. Secondary and Tertiary[2] motion play a significant part in the interpretation of the moving image, but are outside the scope of this paper, therefore the focus is on Primary Motion alone.

It should be noted at this point that this paper is not a philosophical discussion of the nature of movement. It is not challenging epistemic discussions, highlighted by such authors as Broadfoot and Butler (1991) utilizing Deleuze, or Zettl's (1999) exposition of both Zeno's "at-at" theory and Bergson's notion of *durée* (Zettl, 1999:226-228). These authors in the case of the former, successfully make the case that motion does not exist or cannot exist, and in the case of the latter, argue for the differences in the *perception* of film and television as different mediums. Nor do I want to challenge Norman McLaren's notion of "what happens *between* each frame [as being] more important than what happens *on* each frame" (Solomon, 1987:11 quoted in Wells, 1998:10, *italics in the original*). It is what is *on* each frame and how these frames show perceived movement that is the data for this discussion and I therefore start from the assumption that I am analyzing the illusion of movement, irrespective of its complex philosophical vagaries and physical and psychological construction. Furthermore it is necessary to clearly differentiate movement from its related concepts of *inter alia* gesture, performance and dance.

In Heather Crow's discussion of gesture and the uncanny nature of gesture that animates the inanimate, she repeatedly slips between concepts of gesture, movement, performance and animation to discuss gesture as performance, without separately identifying these different elements. She does hint at this separation though, "[t]o say that bodies are animated by gesture is not just to say that they are 'put in motion' (which of course they are)." (Parenthesis in the original) (2006:50). Crow's discussion shows that movement is only part of what creates gesture and therefore what gives life to the inanimate. In the case of gesture, emotion comes to play in the interpretation of the gestural movement, adding a separate and additional level to the meaning created by the gesture itself. Gesture and movement are therefore separate elements.

Likewise when the actor performs, this performance includes movements, gestural or otherwise, especially if these are specific to the character or used to stereotype, such as a shuffling walk for an old man or a young girl skipping; however the performance is not limited to the movement. Paul Wells' discussion of acting and performance (1998) considers movement as the motivated result of considerations of performance to show expression and behaviour (similar

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[2] Zettl's (1999) discussion of these motions shows how the movement of other elements in the construction of the cinematic image, e.g. the moving frame or the edit tempo, also shape the viewer's perception of the on screen movement. For the purpose of analysis however, he separates these different elements.

conclusions are found in Hooks, 2000). As such the most important part of the animator-as-actor's performance process is "the necessity to re-educate the senses in how the body executes simple mechanistic acts" (1998:106). The suggestion is that even simple movements of the body, embodied and not considered by a human being (unless having to relearn those movements already learned at a very early age), become something difficult to recreate, especially in light of the time and effort required to create each movement and the necessity for the movement to play a part in the performance itself. Wells' discussion of acting and performance focuses on movement and the cognitive notions behind realizing movement *as part of* a performance and not performance *per se.* But again in Wells' discussion, gesture, attitude, action, posture and movement are all interchangeable terms in a discussion of performance with no significant differentiation between the concepts.

This interchangeability is also found in Laura Ivins-Hulley's article on the ontology of performance in stop animation (2008), with slippage between the concepts of movement and performance in the case of this particular animation technique. Again we see an application of Hook's "intersection" where Ivins-Hulley explains how "the animator must determine the appropriate movement to express the desired action and emotion" and "the animator must have an understanding of movement to effectively construct performance" (Ivins-Hulley, 2008). Performance is therefore built up from the action to create an emotion that will be interpreted as a performance.

For performance therefore, as with gesture, it is clear that emotion will impact on the interpretation of the movement, but several other semiotic modes become additional levels of meaning. These can include; other sound elements, such as dialogue and the related paralinguistic elements; and elements within and of the diegetic space itself, such as the onscreen elements of *mise-en-scene* (make-up, costume, props, etc.) and the cinematic elements of *mise-en-scene* (camera angles, lighting and editing). These elements all add to the meaning of the image and are therefore interpreted by the audience as "the performance". This individualized interpretation adds the concomitant personal ideological filters to its reading. An interesting test to the idea of movement as performance is to consider the nature of static performance, i.e. performance without or with only minimal movement. Some street performers engage with audiences by taking on the nature of a statue, posing for hours in a frozen moment. This too is performance but clearly without any need for movement. Thus there should be a clear distinction between concepts because while movement can be a performance, performance does not necessitate nor is it made up of movement alone.

And finally dance has a strong symbolic structure to the movement adding multiple connotative levels of meaning, depending on the spectator's knowledge of the movement style or contexts. The above should highlight that it is important to separate and isolate movement itself from the other emotional and ideological elements. Anthony Baldry and Paul J. Thibault bring to light this conflation in their work on multimodal analysis (2006) and how the audience tends to interpret the denotative and symbolic along with the connotative, rendering the latter transparent.

For Thibault (1991) the main undertaking of social semiotics is to develop analytical and theoretical frameworks to explain the social context of meaning-making. Social semiotics investigates human signifying practices in specific social and cultural circumstances, and tries to explain meaning-making as social practice. By looking at elements of movement in animation the argument is that something can be said about animation itself, and animation within society, highlighting for example both visual and/or ideological trends and their related social contexts.

Semiotic systems are therefore shaped by social interests and adapt as society changes and thus new social identities and projects can, according to Hodge and Kress, change patterns of usage and design and must "explain how the social shaping of meanings works in practice" (1988:22). Animation and the movement in animation is one such a semiotic system. Kress and van Leeuwen's work forms part of the social semiotics project and two of their concepts are considered for the analysis in this paper, namely Salience and Framing. Salience creates "a hierarchy of importance amongst the [compositional] elements [of the image]" (1996:212). Framing constitutes "devices which connect or disconnect parts of the picture" (*ibid*:182). In the analysis that follows, these concepts are specifically applied to the kinesic movement of the characters on the screen, analysing if there is a hierarchy of different movements and how these movements interact to create meaning or impact on the interpretation of meaning. Kress and van Leeuwen partially elaborate on these concepts (1996, 2001) in relation to movement but this in itself is a complex discussion that falls outside of the scope of this paper.

The analysis that follows considers two computer generated animation films that are essentially photoreal. These two films were chosen to contrast movement within similar visual contexts, though arguably with different styles and aesthetic influences. *Spirits Within* sets out to push the limits of what is possible in achieving photorealism, whereas *Advent Children*, though still strongly photoreal, did not have the latter as the main objective, being driven rather by a fan base desirous of a cinematic narrative[3]. *Spirits Within* tries to create a synthetic indexically referential diegetic space[4], whereas *Advent Children* whilst visually photoreal, references the styles of both the original game and a more general anime aesthetic.

Final Fantasy: The Spirits Within (2001) is a three dimensional computer generated film set in 2065 on an earth ravaged by phantoms. Dr Aki Ross and her mentor Dr Sid try to understand the nature of the phantoms and thereby discover how to defeat them with the help of Aki's old acquaintance Capt. Gray Edwards. The plot follows a standard post-apocalyptic scenario, where the hero (in this case Aki) must put her life and the lives of those she loves on the line to finally save the world. *Spirits Within* was the first CG film to "attempt[s] to create animated characters that look like actual people" (Plantec, 2008). Peter Plantec in his article *Crossing the Great Uncanny Valley* draws our attention to the psychological reaction when faced with these types of realistic CGI characters that are at the same time both real and unreal. Lev Manovich (2001) also considers this problem of being 'too real' in his discussion of the illusion of synthetic realism. Plantec however highlights some of the elements that affect this reaction saying "as she [Aki] moves, our minds pick up on the incorrectness. And as we focus on her eyes, mouth, skin and hair, they destroy the illusion of reality" (Plantec, 2008:1). It is noteworthy that Plantec refers here to movement, as opposed to performance or gesture, but movement is not necessarily the focus of his discussion as most of the elements discussed are static. Also what Plantec suggests we are focussing on is unclear. Is it the moving hair that distracts us or is it the manner in which it moves that destroys the illusion? In Vivian Sobchack's discussion of *Spirits Within* she also focuses on how technology detracts from the photoreal, quoting the online comments from the IMDB website that speak to the "errors of movement" (2006:178). Sobchack's argument focuses on how the uncanny nature of these errors meant that the film failed to engage with the audience to suspend their disbelief, which while important in the perception of movement and worthy of mention, is not the focus of this paper.

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[3] http://www.imdb.com/title/tt0385700/trivia for Final Fantasy IIV: Advent Children
[4] http://www.imdb.com/title/tt0173840/trivia for Final Fantasy: Spirits Within

Final Fantasy VII Advent Children, (2005) is based on the 1997 console role playing game *Final Fantasy VII* and the narrative follows on from the game events set in Midgar on Gaia, but two years later. The central character, Cloud Strife, tries to unravel the mystery of the Geo-stigma plague, ultimately coming up against the reincarnation of his nemesis Sephiroth, inhabiting the body of another rival Kadaj. The narrative has strong links to the *Final Fantasy* franchise, not only bringing in numerous game characters and references to storylines and themes, but also with the game style narrative structure, a fairly disjointed and complex storyline interspersed with fantastically dynamic chase and fight scenes. The film also has a strong anime influence in its visual design, specifically the use of limited or reduced animation (Wells, 2006:90) in terms of economy of movement. These design elements stem from Japanese animation's roots in the economics of television, i.e. "most effect for the least expenditure" (Clarke, 2004:120) and with the process of creating fluid movement in animation being time consuming and therefore expensive, it is here that production techniques can be made more cost effective by simplifying how movement is created in the image. Clarke states that in Japanese animation "movement does not tend to accompany dialogue but instead body movements are directed towards goals… or very specific poses that express a state of mind" (ibid) and in lip-syncing "there is less of a strong match between mouth movement and the words spoken" (ibid).

The following analysis of the films using Kress and van Leeuwen's concepts of Salience and Framing will demonstrate that these can potentially become important tools in the semiotic analysis of kinesics in animation.

Salience, an element of composition but related to movement, essentially considers aspects of movement that create hierarchies of some kind within the composition of the moving image. From the analysis, two main elements appear, namely technology, in the form of software and programmes that take over some of the more tedious processes of animating, and the shot frame, i.e. the visual as delimited by the edge of the screen, e.g. a close up or long shot.

Being computer generated, technology impacts on both films in terms of what is given preference in the frame. In both cases there is an abundant use of flowing hair, but only for certain characters. Dr Aki, Sephiroth and Kadaj have permanently undulating hair, whereas most male characters have short hair, or in the case of Dr Sid are bald, and female characters may have their hair bound up tightly so it does not flow freely. This is both a technical and aesthetic consideration. It is impractical to animate each individual hair's movement, and so software is developed to essentially take over this function. The software becomes the technological gimmick until replaced by another, but becomes for a time the compositional "fad". Technology, as software or programme, is therefore for a time the deciding factor in the use of a certain motion element in the frame.

However, this application of movement impacts on the image aesthetically. In the case of Dr Aki, where the film makers were aiming for photo-realism, though moving hair was an important software innovation at the time, it distracts from the realism. Even though the movement itself seems very realistic, its application in the image detracts from that synthetic photorealism. Although technological innovations leave aspects of movement up to software programmes, allowing more time to tweak the animated performance, the limitations of computing power ultimately force aesthetic choices on the animator, for example in terms of how many of these autonomous movement programmes can be applied in the rendering process.

Advent Children also has flowing fabric, with garments that react to implied wind and apparent surfaces, creating highly realistic random movement in some of the more dynamic fight sequences. However, this movement is not uniformly applied and not all fabrics have the same

level of realism, again dependent on the character and the situation, lead characters and action sequences taking preference. In some cases the level of application is absurd and potentially completely overlooked by a spectator. Cloud, in *Advent Children*, wears a tight fitting leather body suit, but each shoulder carries a metal wolf insignia with a ring through its mouth. It is only in slow motion viewing of the film that it becomes apparent that this tiny silver ring swings with accurate pendulum motions with each movement of Cloud's body. One could argue that whereas the movement of Aki's hair draws your attention and therefore detracts from the realism, that the unobserved movement of Cloud's shoulder insignia somehow shows the success of a movement in achieving realism in the very fact that it is unobtrusive.

Therefore we can see that technology is both boon and bane; adding potential elements to enhance realism and allowing more freedom from monotonous and repetitive animation tasks, but through overuse, potentially distracting and detracting from that same desired realism.

The shot frame (and here shot frame is used in the traditional filmic sense of how what we see is delimited by the edge of the screen) also defines a hierarchy of use of certain movement elements. For scenes or sequences seen in Long Shot (LS) or Extreme Long Shot (ELS), showing either full figures or crowds of figures, overall body movements, such as walking, running, etc. are distinctly more realistic for both films. In *Advent Children* a number of scenes involve scores of human figures walking across a central square in ELS and in an important fight scene with Bahamut Sin the crowd's movements scattering in LS are equally realistic. Also, the central antagonist, Kadaj, has two dialogues, one with Rufus ShinRa at Healin Lodge and another with the children he takes back to a forest river, where his fluid body movement and actions are extremely convincing and life-like. Shortly after we are introduced to Dr Aki Ross in *Spirits Within* she lands in a deserted street, elevators down to the surface and picking up an enormous firearm, strides out over the broken terrain. As far as her body movement is concerned, her cautious progress over the rough terrain is again highly realistic. By contrast, minutes later into the sequence, she is apprehended by a team of soldiers determined to ensure that she does not become another victim of the phantoms. She is grabbed by Capt. Edwards and a short dialogue ensues in Medium Shots (MS) and Close Ups (CU). In the latter sequence, the various elements of movement in the shot seem less coordinated, less sinuous than in the LSs.

Furthermore both films have teams of Motion Capture (MoCap) staff in the credit lists and it is possible to conjecture that in shots where there is less emphasis on performance and more on simple movement, there is less intervention from an animator and more reliance on capturing movement via software. The coordination and timings of the animator controlled movements in the tighter shots seem more disjointed than the performed movements for MoCap in the long shots. The shot frame therefore determines the use of and by implication the focus on certain technologies, where shots with less noticeable movement detail show less direct intrusion from the animator. The performed movement of the MoCap artist, e.g. by a dancer, mime artist or actor, is palpably different from the animated movement interpreted into a performance via the animator.

From the above we notice that technology and shot framing are both important determinants of Salience with regards to movement. With the introduction of any new computer software this becomes the focus (i.e. the salient element in the composition) of the animators' attention though not always aesthetically warranted. And the shot frame plays an important part in deciding the extent of the animator's manipulation of the characters' movements, either when creating movement from scratch or tweaking captured motion. Again the salient element for the animator in composing the movement becomes, in this latter case, the shot frame.

Framing considers some of the devices which connect or disconnect parts of the image, and more specifically movement in the image. In terms of body movement, such movement consists of both robust and fine movements, i.e. movements that are either large or small. To clarify though, this is dependent on the object size on the screen. A blink in LS is fine movement, being comparatively small in relation to the screen area and other movements of the body, whereas, in an extreme CU, it fills the screen and becomes a robust movement in relation to other smaller movements of the eye and iris. In *Spirits Within* and *Advent Children* the focus tends to be on the robust movements in either LS or CU, leaving the emphasis on fine movements, when applied, solely to the CU or ECU. It is however the fine movements that tend to add to realism and these relate mostly to the eye, the fingers and speaking.The most important fine eye movement that is deficient for both films is saccadic movement. These subtle and continuous movements are the rapid and random shifting of the eye as it takes in the scene and are indicative of a real eye. Both films tend to create realism of the eye through blinking and, much like the flowing hair, it becomes a distraction. In *Advent Children* CUs of Kadaj show high levels of realism through the fluid robust movements of the head and flowing hair and to some extent capture the intricate fine movements of the eyes especially for eye-lines. However the unwavering fixed stare of the character is most disturbing, the eye in fact shows almost no saccadic movement. This may have been a part of characterization, however, the same can be said for Cloud's eye movement and as the hero the audience is presumably not meant to be alienated by his stare. There is one ECU shot of Cloud where during a moment of deep introspection, attention *is* paid to saccadic movement and a realistic performance is achieved, his rapid eye movement representing his inner thought process and the timing and rhythm of which is highly realistic.

Likewise, movements of the hands in these films show variations of realistic movement through the dexterity of the digits. *Spirits Within's* most realistically animated character, Dr Sid, demonstrates many more fine movements in CU, especially in the movement of the eyes and fingers. Dr Sid's hands are more expressive than other characters showing not only more realistic robust movement, but also more subtle digit movements. By contrast in *Advent Children* when Tifa goes to pick up a strip of Cloud's bandage in Aerith's Lodge, she grasps the material with a clumsy, childlike closed palm hand, rather than with dexterous fingers.

Lastly the problem of lip sync occurs on numerous occasions in both these films where the complex subtleties of the interaction between the movements of the lips, tongue, teeth, mouth muscles and cheeks are overly simplified. Though such choices may be justified for technological reasons, or in the case of specifically *Advent Children* for stylistic reasons following an anime lip-sync style, ultimately this detracts from realism.

In the years since these films were made, both software and the subtleties of performance in animation have grappled with some of these problems and later films show that lessons have been learned. What is important for this paper is not the problem *per se* but isolating the movement related devices (i.e. the frames) that can be used to disconnect the movement for the purpose of analysis, and so the concepts of robust and fine movement and saccadic and digit movement become potential framing tools for analysis. Whilst these elements disconnect movement, their interrelationship, e.g. what movements combine to create a particular performance, leads to the possible framing device that could also connect them. Movement is seldom isolated to either its robust or fine elements, or a single movement of either of these, but is usually a complex combination of multiple elements simultaneously. It is this combination that also adds to a sense of realism, but more importantly the co-ordination of these movements that creates such. This orchestration of movement is best described as a form of choreography.

Using Kress and van Leeuwen's concepts as a starting point, this analysis considered the movement elements in the CG animation characters from *Final Fantasy: The Spirits Within* (2001) and *Final Fantasy VII Advent Children*, (2005). The analysis has shown that Kress and van Leeuwen's concept of Salience is useful in highlighting how both technology and film aesthetics play a part in the method used to animate movement and ultimately what the aesthetic impact is of these choices. Likewise their notion of Framing has highlighted devices to both disconnect and connect various movements in an image to describe the kinesic performances. And though it is true that "the illusion of life in animation [is] profoundly more challenging than the seemingly unmediated and recognisable representation of reality in live-action films" (Wells, 1998:15), when animation specifically sets out to challenge reality as a simulation, it is the illusion of reality that is, to animation, the greatest challenge of all.   ✎

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