The synergy of visual projections and contemporary dance

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Thesis

The Synergy of Visual Projections and Contemporary Dance

Bachelor of Arts Honours (Dance)

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USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.
Abstract

Projections are becoming an increasingly common part of contemporary dance performance, however, I believe that choreographers do not always integrate the media to form a dependent synergy. My research addresses the principal question:

What are the factors that indicate that there is a critical relationship (synergy) between projection, including art work, moving images or light and the dancer in a contemporary dance performance?

A brief history explains the background and development of lighting technology, through to film and more recently motion capture technology. Through sources of pre-existing literature and my interpretation of video excerpts of contemporary dance, I explore various techniques and effects generated by projections. The examples are categorised by three relationships; firstly the dancer initiating a response from the visual imagery; secondly, the visual imagery stimulating a response from the dancer and; thirdly, where there is a connection between the dancer and the projected imagery that is only visible to the audience.

Techniques such as layering of images directly onto the body, using motion capture technology to project digitalised light patterns onto a dancer and the space, as well as using projections as a backdrop are all explored for evidence of an interdependent synergy.
I certify that this thesis does not, to the best of my knowledge and belief:

I. Incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education
II. Contain any material previously published or written by another person except where due reference is made to the text; or
III. Contain any defamatory material

Hannah Timbrell
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1. Introduction

This research addresses the principal question:

What are the factors that indicate that there is a critical relationship (synergy) between projection, including art work, moving images or light and the dancer in a contemporary dance performance?

For this study, I will discuss the factors such as interdependence of media and positioning of various projections in contemporary dance to form a synergized performance outcome. Although scenic projection in dance is not a new concept, increasingly, the intersection of choreography, dancer/s and visual projections have been used with varying degrees of synergy and communicative effectiveness.

Initially, I will briefly examine the history of incorporating visual projection and moving imagery, from the illusions created with light and mirrors by Loie Fuller to more recent advancements in technology as seen in Chunky Move's Mortal Engine. My main focus will be on performances where there is a critical relationship between the dancer and the projections, and where the meaning and visual effect would be completely altered without both media. I will also discuss what the outcome of this synergy means from an audience perspective, and mention some of the challenges of using visual projection in contemporary dance and choreography. The research has been conducted from existing literature in conjunction with my own interpretive evaluation of performances that incorporate the body/bodies with visual technologies.

2. Body in Light and Vision

2.1 A Brief History and the Development of Technology

This section will briefly outline some of the major advancements in technology that have been employed and integrated into dance and theatre performances throughout the 20th century. I will discuss the purpose of lighting dance works and explain the capabilities of some of the newest motion tracking software.

Loie Fuller (1868-1928) was a pioneer in the development of light in stage performance. Born in America, Fuller moved to Paris in 1892, where she quickly became popular with audiences for her vaudeville variety acts. Many of her stage performances involved creating an illusion for the audience through utilising devices such as coloured lighting effects, billowing fabrics and mirrors (Hindson, 2006, p.162). In Fuller's early repertoire of performances, Mirror Dance featured in many shows. The work had a backdrop of four mirrors, arranged in a semi-circle and caused the "reflection, refraction and lighting to present the audience with a kaleidoscopic version of identical, draped dancing figures. Although there was only ever one dancer on the stage..." (Hindson, 2006, p.163-164).
As well as being a favoured performer in Paris during the 1890s, Fuller was interested in a great many things, including science and technology (Hindson, 2006, p.162). During the late 1800s and early twentieth century, Fuller "commun[ed] with scientists and artists, experimenting with chemical dyes, designing and producing magic-lantern slides and photographic images to use for the fabric of her dresses and lighting gels, including telescopic images of the surface of the moon" (Hindson, 2006, p.168).

Although the footage in *Lumière Brothers – The Serpentine Dance (c. 1899)* is not of Fuller herself dancing, the film demonstrates a very similar example of the type of performance Fuller would have staged. The dancer is clothed in a long billowing dress and extra fabric is draped over sticks that are held in each hand, extending the length of her arms. She proceeds to twirl around and uses her arms to make figure eights of swirling material. Bending down she is almost engulfed by the material. All this while, various coloured lights are projected onto the dancer, effectively making her skirt appear to constantly change colour (317East32nd, 2006).

This footage clearly demonstrates the importance of both the movement and lighting to create the whole visual illusion. Fuller’s success was reliant on producing a fusion between these elements. Fuller was also seen to use "light and fabric to create an ongoing motion from which images of nature spontaneously burst forth – ‘flower, insect, storm or flame’" (Albright, 2007, p.161). This demonstrates that even during the turn of the 20th century a synergy between the lighting technology and movement could achieve spectacular visual outcomes for the audience. This has continued to develop and expand over the centuries.

The next major advancement is evident in the work of Vsevolod Meyerhold (1874-1905). Meyerhold, a revolutionary theatre director in Russia began incorporating slide projections into his theatre works during the 1920s (Istel, 1995). Sergei Eisenstein, a previous student and supporter of Meyerhold, developed his own career in film making. Eisenstein created the theory of montage and is quoted by Jonathan Pitches as stating “the simplest juxtaposition of two or three details of a material series, producing a perfectly finished representation of another order, the psychological” (Pitches, 2003, p.74). Eisenstein contrasted two images together in order to stimulate “our psychological response to those things...” and the audience would naturally “create a third ‘representation’, a higher level of meaning produced by our own skills of association” (Pitches, 2003 pg 74). A good example, which incorporates Eisenstein’s ideas of montage, is seen in his 1925 movie *Battleship Potemkin* (Kaidibo, 2007). “The Odessa steps massacre in the film condenses the suppression, which actually occurred in the city [southern Ukraine] into one dramatised incident, and this remains one of the most powerful images of political violence ever realized” (Grace, 2000). Contrasting single images of innocence, such as a baby in a pram, the baby’s mother and an injured child, is juxtaposed with images of violence such as the mass of soldiers moving down the stairs towards the citizens. The military are filmed from a distance and often from above, which gives the impression of power. This is contrasted with close-up shots of the innocent people, enhancing their powerlessness and desperation.
Eisenstein's use of shooting film from various perspectives and the contrast of images influenced many action films and these techniques can still be seen today (Shaw, 2004).

Erwin Piscator incorporated film and projections into his plays during the 1920s as a political means to promote his revolutionary ideals. Footage of war can be seen in Toller's *Hoppla, Such is Life* directed by Piscator in 1928 and illuminates for the audience the passing of time and certain other historical events. As the film that Piscator incorporated into his plays was an indisputable account of world affairs, Piscator was able to contrast this with opposing claims and, as a result, formed a strong base to provide scathing commentary on the state of affairs Piscator wanted to attack: *Film commentary* accompanies the action in the manner of a chorus... it levels criticisms, makes accusations, provides important facts, indeed at times it carries out direct agitation... (In Mitter & Shevtsova, 2005, p.43)

During the 1920s "in the metropolitan theatres and opera houses of western Europe and America, projected imagery was perceived as offering greater scene realism, greater atmosphere and a more rapid and magical change of scene" (Baugh, 2005, p.120).

Istel believes, however, that "no experiments with projected scenery in this half of the century have been as thorough or dazzling as Czech designer Josef Svoboda's, whose *Laterna Magika* productions in Prague merge film and slide projections with live performance" (Istel, 1995). Svoboda founded the Laterna Magika theatre in 1973. While at the height of his career during the 1960s and 1970s, Svoboda continued his scenographic work as Artistic Director of the Laterna Magika until close to his death in 2002 (Baugh, 2005, p.83). A 'scenographer' is responsible for "all the visual and aural contributions of theatre and performance: the stage setting and properties, costume design, lighting and sound design" (Baugh, 2005, p.84). Svoboda experimented with new technologies to discover "new surfaces to receive and transmit projected images" (Baugh, 2005, p.86). Svoboda is quoted in *Theatre Performance and Technology: The Development of Scenography in the 20th Century* as saying "I perceive light physically, not only visually. For me, light becomes a substance" (Baugh, 2005, p.119). He "was consistently sensitive to the inter-relation of time, space, movement and light in the theatre" and he "attempted to create kinetic, mobile stage pictures which changed in tune with the changing rhythm of the drama" (Baugh, 2005, p.135, p.126). Bergman believed that Svoboda, with the help of light, managed "to give even the décor a dimension of time" (In Baugh, 2005, p.126). An example of projection can be seen in Svoboda's design for Prokofiev's *Romeo and Juliet* (1971).

His scenography ... was black and heavily punctuated with beams of back-light that framed the action. A seemingly floating colonnade of exquisitely proportioned
Renaissance arches traversed the stage, covered in a dark surface that received the dim projected image of a texture similar to highly magnified fabric. As the tragedy progressed, the texture grew in size as though magnification was being increased. (Baugh, 2005, p.140)

The stage was dim and if it had been fully lit to see the actors, the light projections would have lost their effect. To solve this problem Svoboda used “subtly coloured, soft-beamed spotlights whose intensity and colouring could change as needed” to follow the actors (Baugh, 2005, p.140). This produced a synergy, whereby the actors and the lighting were dependent upon one another to holistically support the story.

Alwin Nikolais was a creative master of the arts, combining a range of media with dance to create a spectacular effect (Gitelman & Martin, 2007). Nilokais began choreographing predominantly post World War II, in America. Nikolais directed New York’s Henry Street Playhouse in 1948, where he formed his own company, later named Nikolais Dance Theater. Nikolais developed his theory of ‘decentralization’, which involved depersonalising the dancers, and “through costume and design they could be liberated from their own forms” (Alwin Nikolais in American Masters, 2005). Nikolais’ 1953 production Masks, Props, and Mobiles explores decentralization. The dancers are concealed by large stretchy bags, which are manipulated by the dancers’ movement to create abstract shapes (Au, 2002, p.159). Through a combination of media, Nikolais was able to “shift the focus away from any one individual dancer, and concentrate on the overall effect of the production” (Alwin Nikolais in American Masters, 2005). Nikolais “flooded dancers with changing light patterns so as to blur distinctions between illusion and reality and make it difficult for spectators to determine which shapes before them were real and which were shadows or slide projections” (Anderson, c1997, p.203). Alwin Nikolais’ 1967 production Somniloquy incorporated slide projection to a great extent and he himself was responsible for hand crafting 200 slides using various creative methods. “Some [of the slides] were painted with aniline dye; some were collages of bits of gelatine; some had designs scratched into opaque paint; some had layers of different color gel that were laminated together by baking” (Gitelman & Martin, 2007, p.51).

Whilst in the making of this production, Nikolais choreographed the movement sections alongside the design for technical elements including the lighting cues and the projections to link the media more strongly (Gitelman & Martin 2007). As Nikolais believed that “art should be nonnarrative although highly suggestive” Somniloquy contains no all-encompassing theme, instead providing “a succession of abstract sensations, to which the audience could apply its own imagery” (Gitelman & Martin, 2007, p.48). At one point, Nikolais encouraged the dancers to individually view a section of the performance from the audience’s perspective. This allowed them to better understand and perform the illusion of moving through a stage that was covered in projected white dots (Gitelman & Martin, 2007, p.49).
Merce Cunningham, a contemporary of Nikolais, also incorporated choreography, music, décor and film into his performances, however, all of these elements were "conceived in mutual isolation" (Copeland, 2004, p.4).

Three aspects of Cunningham's choreographic theories have been especially provocative: his use of chance and indeterminacy; his treatment of stage space as an open field; and his tendency to regard the components of a dance production as independent entities. (Anderson, 1992, p.184-185)

In many cases, the elements that made up a Cunningham work "often encountered one another for the very first time on opening night" (Copeland, 2004, p.4-5). Cunningham's Variations V (1965), incorporated video projection by Stan VanDerBeek, and video distortion by Nam June Paik. During the performance "images of free-floating, isolated astronauts appeared in the film sequences" (Copeland, 2004, p.33). According to Copeland (2004, p.41), "[t]he images didn't meld seamlessly into one another. There was no attempt to clobber the audience into blessed out submission ... 'Variation V' was an example of un-mixed-media." In order to absorb the unrelated media simultaneously, the audience would have been forced to divide their attention. In my opinion, this is a prime example of dis-synergy. Though presenting co-existing independent elements is Cunningham's purpose here, neither the projection nor the dance are dependent upon one another, which is essential in my idea of synergy.

Cunningham developed a computer software programme called Life Forms, which he began experimenting with in 1989. He used the programme as a choreographic tool to develop movement.

Life Forms represents the human body as individual joints moving in space and time. The software can be used to illustrate the flexing of a joint, to determine the height or length of a jump, to reveal a dancer's exact location in a virtual performance space, and to elucidate the transition from one dance phrase to another. (Kam, 2005)

Biped was choreographed by Cunningham in 1999 for his company and mixes computerised graphics with the choreography. The graphics were developed by Shelley Eshkhar and Paul Kaiser from movement phrases that Cunningham choreographed using his software. Large figures of the dancers, illuminated by green and blue lines, are projected onto the scrim and overlay the live dancing as well as forming a moving backdrop. In some cases the images appear so large that it feels as if they are magnified for the audience as they are "floating and rotating off into space, even decomposing" (Contperf, 2009).

More recently Frieder Weiss, a German lighting projection designer and software engineer has combined his computer skills with the choreographic talent of Gideon Obarzanek, director of Melbourne-based dance company Chunky Move. Through their collaboration they worked towards creating Glow, a solo
performance, which premiered in 2006. In a PopTech (2009) interview, Obarzanek explained that he had worked with pre-rendered video in several of his previous works but that many rehearsals were required to create the appearance of synergy between the video and the dancer. The motion tracking software allowed for a much more precise and consistent synergy to form in comparison to using pre-rendered footage. The motion tracking software that Weiss has developed is able to analyse information from a moving body such as the height of the performer, their width and where they are within the space (Weiss, 2008). Simultaneously the software is able to work out how fast the dancer is moving and what part of the body is being used (StageNoise, 2007). Infrared cameras pick up the information and send the data to a computer running video generating software. The software “uses various algorithms to process that information to create images” (PopTech, 2009). Obarzanek then “project[ed] that back onto the stage itself, onto the dancer, onto the person that’s actually producing that information” (PopTech, 2009). During the collaboration, Obarzanek discovered several qualities that Weiss’s software system seemed to provide, which were a “sense that something was emanating from the body. There was this sense of being able to see into possibly someone’s imagination, or the effect that they were having on the space around them” (PopTech, 2009).

Throughout the entire performance of Glow, the solo female dancer moves on the floor. The audience views the piece from steeply raked 360 degree seating. Obarzanek chose this viewing arrangement because he believed that “it is important that the performer is actually on the image or in the image,” as compared to always using “vertical surfaces where the performer’s always at the base of the screen” (PopTech, 2009). The 360 degree seating effectively removes the top, bottom and sides of the visual projection allowing the dancer to fully move in synergy with the projected light images. Obarzanek “wanted to achieve this sense of weightlessness and also [that the dancer was] floating” (PopTech, 2009). However, from excerpts that I viewed on YouTube I did not perceive this sense of floating. Instead, I felt that the dancer was very grounded (StageNoise, 2007). In my opinion, this impression of groundedness was supported by the idea of looking down upon the whole work, whereas my idea of floating suggests suspension or being above the image. Technically, the dancer was under the image, with the light being projected from above. This positioning of the media lends itself to a synergy being formed that is reliant on both the light images and the dancer with complete interdependence between the two.

With the significant advancement of lighting technology since Loie Fuller began her scientific experimentations, the complexity and precision with which light can be manipulated has dramatically improved. Fuller was able to use new technologies from her era to achieve a synergy in body and light that fascinated audiences, in much the same way that performances using Weiss’s motion capture technology can delight audiences of the 21st century. Perhaps the excitement for the audience is that they do not entirely understand the mechanics of the technology so there is a certain mystery as to how the synergies are achieved. The development of technology has broadened the creative possibilities for choreographers as they continue to explore the synergy of body and projection. In just over a century, the lighting designer is now able to control
certain aspects of light to alter and impact the meaning and mood perceived by the audience. Gillette has divided the “controllable qualities of light” into four categories. They are “distribution, intensity, movement, and colour” (Gillette, 1998, p.6).

Distribution refers to:

(1) the direction from which the light approaches an area, actor or object; (2) the shape and size of the area that the light is covering; (3) the quality of the light – its cohesiveness (clarity or diffusion); and (4) the character of the light – its texture (smooth, uneven, patterned, hard – or soft-edged, and so forth). (Gillette, 1998, p.6)

Intensity is characterized by “the actual amount, or level of brightness, of the light that strikes the stage or the actor.” The intensity can vary between “total darkness to painfully brilliant white light” (Gillette, 1998, p.6).

Movement in this case identifies the timed length of a lighting cue such as “how long it takes for the lights to become more intense or fade out.” Also under the heading of movement includes light from a moving onstage source such as a candle and moving light sourced from offstage such as a followspot (Gillette, 1998, p.6).

The colour palette to choose from when lighting a production is wide and multiple colours can be obtained during a performance.

2.2 Forming a Synergy and Making Connections: The Three Relationships

Synergy can be defined as “The effect greater than the sum of the parts that comes from the combined operation of a number of forces, persons, mechanisms, etc” (The Macquarie Dictionary, 2001, p.1906).

In this case, the sum will include visual projections of still images, moving images or computerised light effects, along with contemporary dance to produce a whole experience for the audience with an interdependence between the visual projection and the choreography.

According to Greg Giesekam, the type of works that I will be focusing on can be categorised as intermedial as opposed to multimedia. Although this reference is specific to a theatre type production, the idea can be applied to a contemporary dance performance. The difference between the two medials is that intermedial productions contain more interaction between the various media [which] reshapes notions of character or acting, where neither the live material nor the recorded material would make
much sense without the other, and where often the interaction between the media substantially modifies how the respective media conventionally function and invites reflection upon their nature and methods. (Giesekam, 2007, p.8)

Giesekam explains that utilising film allows time, space and action to be altered. The past, present and future may be represented throughout the work and events or scenes from other locations may also be included. “Traditional boundaries between offstage and onstage become blurred, as the stage becomes the meeting-point of many locations, real, fictional, and of fictional characters with filmed real-world figures” (Giesekam, 2007, p.10).

Director of theatre work, *Sinatra at the Palladium*, David Leveaux observes:

> Theatre and multimedia are moving together, in some ways, but that doesn’t mean everything recommends itself to the same treatment. None of the technology makes sense unless it is channelled into something human. Technology, on its own, can’t make a show live and breathe. (In Smurthwaite, 2006)

I feel this is true to dance, music and theatre pieces that are collaborative works with visual projections. To create any kind of successful relationship on stage, there needs to be a compromise during the working process. This is no different from the usual relationships occurring between the collaboration of a choreographer or theatre director with the artistic lighting and projection designer.

Whilst each choreographer has their own process of developing a bond between both elements, ultimately there needs to be cooperation from all parties. Trisha Brown, when creating *How Long Does the Subject Linger on the Edge of Volume* in 1990, noted that much of the choreography had formed in the months prior to even viewing the graphics. After seeing the graphics with the choreography, it was evident to Brown that “my formal, organised choreography got overrun by the expansive graphics” (Mirapaul, 2005). In order to create a more harmonious balance, Brown negotiated the choreography, which resulted in a favourable comment: “Although the work is built on her core vocabulary, her dancers are covering more ground so they are not obscured by the graphics” (Mirapaul, 2005).

Most of the graphics in *How Long Does the Subject Linger on the Edge of Volume*, which can be viewed in an excerpt on the Trisha Brown Dance Company website are abstract shapes, lines and angles that look as if they were part of a mathematical equation. Despite the use of electronic sensors and motion-capture technology, the relationship between the two media is often difficult to understand. Many of the projections were above the dancers’ heads, however, when the images were projected onto the transparent screen in front of the dancers and on a much lower level, the media becomes more closely connected.
Brown, 2009). Mirapaul explains that the graphics can “respond in real time to the dancers [and] can illustrate, interpret or provide counterpoint to the movements” (Mirapaul, 2005). While a synergy is present in the creative process, since the visual projections are reliant on the data from the electronic sensors attached to the dancers, the interdependency is not always obvious in the performance outcome and varies with the positioning of the graphics.

The use of projections can lead to many new pathways and possibilities when used in conjunction with the arts, however, it can also prove to be restrictive. In Klaus Obermaier and Chris Haring’s Vivisector, premiered in 2002, the “choreography is inevitably limited by having to confine the dancers to spaces where the projections can reach them” (Mackrell, 2003b).

Excerpts on YouTube show that the stage in Vivisector is divided into four zones, one for each of the male dancers. For the majority of the performance, the men are spaced in a staggered line horizontally. They have a long rectangle of space and vary their use of the foreground with the depth of the stage. The men must have very accurate spacing during the performance as digitally altered projections of themselves are projected back onto their bodies. In order for the projections to be fully appreciated on the moving figures, the live movement becomes slower and restricted in order to achieve visual clarity (Viennaexile, 2010b, 2010c, 2010d, 2010e). The layered images connect strongly with the dancers and despite the movement restrictions the visual outcome is completely dependent upon both mediums working together.

In the programme notes for Good Morning Mr Gershwin, a piece comprised of a collage of dance styles and performed by Compagnie Montalvo-Hervieu, the use of imagery within their production is explained.

Technological imagery – with the possibilities of projecting, editing and pasting it provides – allows them to invent a tangible world in which the images entertain a malicious dialogue with the body in all the immediacy of its physical presence, its bodily and sensual weight. This juxtaposition gives rise to utterly original moments of poetry, beauty, humour and turmoil. Without ever dwelling too long, it challenges the slippery, unreal borders between reality and its representations. (Good Morning Mr Gershwin, 2010, p.4)

To identify a synergy between the media, it is essential to understand how projection and dance work together to create a whole. I have often noticed that, in many multi-media performances, the relationship between the dancer and the projection seems to be a one-way interaction. Either the image is programmed to track the movement on stage and respond to the dancer, or the dancer sees the image and this provokes a reaction. There are also many instances where neither the dancer nor the visual projections acknowledge the presence of one another, even though there is still a strong connection between the two, which is visible from an audience perspective. In these cases, often the linking factor between
the media is generated by the visual stimulus creating an environment or scene, an illusion or layers of imagery on the bodies. They can also be used to develop relationships and interaction, and enhance concepts and ideas, whilst allowing the choreographed movement to remain abstract. These factors allow the audience to perceive the performance outcome as a whole, quite differently compared to the reception of a production comprised of pure movement or film.

With these three distinct relationships in mind, this paper will endeavour to provide examples of synergy within contemporary dance performances and illuminate the factors that produce these holistic relationships for the audience to experience.

2.3 Relationship One: The Dancer Initiating Effect

In relationship one, the dancer creates the illusion that they are initiating some kind of visual effect with the imagery. There is often a purpose to the movement, an intention or focus and sometimes emotion is portrayed. The way that the dancer can initiate visual effects and stimulate interaction is largely dependent on how the images are projected into the space and where they are in relation to the dancers. Each form of projection highlights a slightly different link between the dancer and the image.

In *Scattered* (2009), a work choreographed by Kevin Finnan and performed by Motionhouse Dance Theatre, images are projected onto the back wall, made from a boat hull. The wall curves into the floor, enabling the dancers to physically jump further up the wall and slide down to the floor. The images set the scene and portray various continually evolving water environments. In a review of the performance, Mackrell (2009) states that:

[The ambitious integration of live movement and film allows the dancers to explore our tactile, emotional and symbolic relationship with water. A huge curved floor and projected imagery by Spanish film-makers Logela Multimedia create a kind of infinite stage, in which seven dancers appear to dive into ocean depths, surf turbulent waves and scoot across frozen ice flows.]

In one section of the work, two dancers launch themselves in compact balls at the wall, which is projected with a water scene film. Directly after they rebound off the backdrop and back to the floor, the projected film shows two splashes in the water and, as if still feeling the effects, the image continues to ripple (MotionhouseDT, 2010). Whilst the dancers could still perform the same choreography without the pre-rendered images, the projections give context to the movement and allow the relationship between humans and water to be explored.

Obarzanek and Weiss continued their collaboration, working intensely to expand on ideas presented in *Glow* to create *Mortal Engine* in 2008. Obarzanek said:
Initially, I wanted to use video projections as a kind of lighting. ... I wanted to know whether it was possible for a projector to understand where dancers are. Rather than working with pre-rendered video, I wanted video that could respond to the movement. (In Grundy, 2008)

Although, technically speaking the visual projections all appear through complex formulae in response to the dancer’s movement on stage, there is such a unity between the two media that is difficult for the audience to know which initiates and which responds (Chunky Move, 2010).

Obarzanek admits that this concept is not entirely new but he believes that “we’ve taken this to a form which has become very powerful, and very evocative. It’s not really about the system, it’s not really about interactivity, it’s really applying that kind of technology to tell these much more human stories” (In PopTech, 2009). Perhaps these human stories are clear for the choreographer, however, they may not always be understood by the audience. Certainly a synergy is evident and is critical to the success of the work.

An example, which demonstrates the dancer initiating a visual response, is evident in Mortal Engine when a lone dancer is on the floor, and the stage appears to be swarming with projected cockroaches. The dancer moves suddenly, extending one leg and grabbing her toe. With this sharp movement some of the cockroaches scurry away (Chunky Move, 2010).

Increasingly sophisticated sensory software is being developed and becoming more widely used by choreographers. However, works with pre-rendered video such as Scattered demonstrate that it is not essential for high-tech sensory software to be employed to create a dependent synergy.

ICH\(^2\) (Me to the power of 2), is a 360 degree intermedia dance performance, choreographed by Mario Schröder with visual designs by Alexander Brauch, Christian Engler, Jens Ewald, Michel Magens and Patrick Müller. The performance was created for a planetarium and projected film covers the interior of the dome. Various types of projection are used throughout the piece to create different effects (Duscher, 2007). Motion sensor tracking is utilised in Scene Six titled Source and demonstrates an obvious although abstract relationship between the dancer and the projection. The background on the dome is blue with moving squares. The squares can travel up, down, expand, contract, appear to move closer in the space, all in response to the dancer’s movement. For example, if the dancer moves closer to the audience then the square will grow bigger and then when the dancer moves away from the audience the square will shrink. If the dancer makes a windmill arm action over the top of her head then the squares in each row will be affected and move up or down accordingly. In this particular moment of the piece, the main focus seems to be the aesthetic connection between the media and the fascination with how the dancer manages to be a catalyst for the changing squares (Media ICH\(^2\), 2006d). While the projection is dependent on the dancer to provide movement data through motion capture technology, the result seems to be a ‘cause and effect’ rather than a true synergy.
D.A.V.E. – Digital Amplified Video Engine, is a solo performance danced and choreographed by Chris Haring and developed by Klaus Obermaier between 1998 and 2000. The piece is a fascinating experimentation of believable and unrealistic images layered onto Haring’s body. The effect of this often persuades the audience into believing the impossible and wondering how the result was achieved. It is only a few moments later that the audience can pick up on other clues, which help them to discern the difference between the manipulated images and the real life body. Haring is dressed in pale blue jeans throughout the work and dances bare-chested, which undoubtedly leaves a prime base on which to project the images with more clarity and precision.

Haring often moves minimally whilst the images are projected onto his body and, yet, the piece is not completely devoid of dancing. Often the sections with layered images are interspersed with plain movement phrases.

A one point, Haring reaches over to his right shoulder, steps out to the side and appears to rip off his skin leaving a red tissue underneath. Haring’s live vision is focused on the bared shoulder and as soon as his grip releases on the projected skin, the skin pings back like an elastic in to place. This one moment of Haring focusing on his shoulder as he tears away the skin makes it more believable in the sense that he is seeing the event occur on his body and is confidently reacting to the occurrence (Viennaexile, 2010a). Similarly to Vivisector, the projected images connect strongly with the dancer. Haring is an essential base for the images to be projected on, and they would seem meaningless without the dancer present to manipulate them. Therefore, interdependence is realised.

2.4 Relationship Two: The Projected Image Instigating a Response from the Dancer

Relationship two involves the dancer responding to projected imagery. When the dancer does directly engage with the image, there is often an emotional reaction. The dancer may comprehend the images as if they were live three dimensional objects and so the reaction may be more literal or gestural.

Aimee Smith’s Breakings (2010), is a fine example of the images instigating a response from her solo performance. One corner of the stage is set up with a bed, desk, food cupboard and window. At various points within the set, there are televisions and on each television a different image is showing. On one screen, a cat sits and, in response to seeing the cat, Smith promptly picks up a can of food and places it in front of the cat to eat. Smith also strokes the television treating it as if it were a real live cat. This example is a very literal response, perhaps suggesting that the media simplifies information and does not leave a great deal to the viewer’s imagination, however, Smith also incorporates abstract responses within the same piece.

In one section of the work, a square of static imagery, representative of a television screen test pattern, is projected onto the stage floor. Whenever Smith steps into the static box, her movement becomes quite disconnected. Smith steps
in and out of the box several times so the audience can clearly see the link between her reaction while in the static space and compare this to her behavior when outside the non-static space. As an audience member, I tried to make meaning from this section of the work. The message that I conjured was that when people don’t have reception or aren’t being told what to do by the media there is a sense of panic, not knowing quite how to respond. It was almost as if the brain was working in overdrive to comprehend the situation. The response in Smith’s case was to over compensate for not having any instructions (from the test pattern) and, consequently, to try to do everything at once (Smith, 2010).

Synergy is evident throughout "Breakings" as Smith reacts to the visual projections, allowing the audience to make meaning from the produced relationships.

The projected image instigating a response from the dancer is a common relationship seen in works performed by Compagnie Montalvo-Hervieu. As the backdrops are pre-rendered video imagery, the dancers’ responses must be precisely choreographed for the audience to perceive a connection between the two media. Often the images include projections of animals, unrealistic in their size relationship to the dancers. Paradis, choreographed in 1997 by José Montalvo and performed by Compagnie Montalvo-Hervieu, demonstrates a comic chase scene between real live performers and projected animals. Duplicates of the real performers are also seen in projected form. The stage backdrop is formed by a white sheet that hangs down in strips, forward of the back wall, allowing the performers to emerge part way on stage and disappear between any of the sheet strips. While many live performers run in and out, animals including horses, camels, tigers and zebras, as well as a man riding on a bike are projected onto the strips and sometimes also disappear behind the sheets. Some dancers seem to be running away from various animals, while others appear to be chasing them. Interaction also occurs when, for example, the camel flicks its tail, which appears to hit a live dancer’s face and causes her head to move backwards. While this example demonstrates evidence of interaction and a response from the dancer, it also shows how restricted the live dancers are in their quest to make the scene come to life for the audience. In order to achieve this interaction, the live performers stayed in close proximity to the backdrop. This enabled the dancers to be more precise when making the illusion of contact with a projected animal or human figure. If the dancers moved downstage in the space it would detract from the image of running along the same line. Considering the imagery is pre-recorded, timing of the movement is critical and there is little room for error. On the whole however, the projected animals appear quite realistic, especially when the projection shows the sheet flap being opened for the horse to walk through (Montalvo, 2007).

Compagnie Montalvo-Hervieu make use of projected images to form a fantasy land backdrop with which the dancers can interact and create humour. Image size in relation to other images and live performers is explored and contributes to the surrealist atmosphere in "La Bossa Fataka de Rameau," choreographed jointly by Montalvo and Dominique Hervieu in 2006. In one section a giant chicken is projected, taking up the entire backdrop screen, and this is contrasted with a live man who is about a quarter of the size and is preparing to step on the foot of the chicken (Hervieu & Montalvo, 2006a). As much of the movement performed by
Compagnie Montalvo-Hervieu is choreographed to ‘fit in’ and support the projections, neither medium would be meaningful without the other.

2.5 Relationship Three: The Connection Between the Dancer and the Visual Imagery as Perceived by the Audience

Relationship three appears to be the most common kind of relationship between the dancer and visual imagery in a contemporary performance setting. The relationship between the two media is clear for the audience, however, neither the dancer nor the imagery provoke one another to respond. In this sense it is more of a choreographed connection.

The layering effect of images on a body gives a new dimension to dance works. The juxtaposition of two dimensional images provokes continual change as a three dimensional figure moves through the image, warping contours of the images and in some cases the reverse occurs and the live human figure is warped as the projected images appear more strongly to the audience than the body. Good examples of this are seen in D.A.V.E. and Vivisector, both created by Obermaier and Haring in collaboration. Excerpts of these works can be viewed on YouTube.

Illusion is used to a great extent in D.A.V.E. and seems to be a very effective result of layering images. In one case, Haring stands still, just a floating torso with his head and legs hidden by the lack of light. Many pairs of hands appear out of the darkness to feel Haring’s torso. Not knowing to whom the arms and hands belong to creates a sense of mystery and the images also present possibilities such as giving the impression that there are more performers on the stage than is the actuality. As the hands appear out of nowhere, there is a true element of surprise for the audience as they don’t preempt any extra or unnecessary movement from other live performers (Viennaexile, 2010a).

As the piece progresses, we see more impossible human moments. Haring stands to face the front, before slowly turning 180 degrees on the spot. Projected onto his back is a topless female torso, which turns around to meet the audience. The image is powerful as the live performer and the projection cannot be prised apart from one another and the vision could suggest that there is a feminine side to this man. Perception of the audience may vary and others may see this projected woman as an influential figure in this man’s life. The image looks grotesquely realistic except for the live performer’s heels facing the front and proving that what we see is an illusion.

At one point, Haring kneels on the floor facing the front. It is difficult to discern which way Haring’s live body is facing because he has images of heels projected onto his knees, which make it look like his lower limbs are twisted back to front and entirely separate from his torso. His arms move up beside his ears and push at the sides of his face. This gesture, combined with the projected face, which is layered directly on top of Haring’s live face, gives the impression that he is manipulating and distorting his body as his projected face becomes thin and long.
A similar kind of distortion is repeated when Haring places his arms by his side and his whole torso squeezes into the shape of an hour glass figure. Haring proceeds to stand up and this is when it becomes clear that he is truly facing the front because of the creases in his jeans around the knee area. Haring pulls down the projected image of his shoulders so only his stomach remains. When he lets go, the projection springs back to a more believable reality (Viennaexile, 2010a).

In another moment, a floating head is visible and the rest of Haring's body is blocked out by darkness. His hands are placed covering his eyes so the fingertips meet at the bridge of his nose. Projected onto his palms are giant eyeballs and Haring "turns into" an alien. The eyes blink and look around before shrinking into nothing. The hands carefully slip out of the light but the face remains. Then we see the hands emerge from underneath the man's chin. They cover his mouth and stop under the nose. A mouth, which is large and out of proportion, is projected onto the back of Haring's hands and the mouth opens wide (Viennaexile, 2010a).

The layered imagery in D.A.V.E. merges successfully with Haring's body to surprise the audience and create illusions through distortion and grotesque imagery that would be impossible to produce without the two media. The effects presented in this work are entirely dependent upon the synergy between the media and a similar connection between body and projected light and images is seen in Vivisector.

Obermaier and Haring's Vivisector utilises altered video projection and specific light patterns to create layers on the live bodies and explore thought provoking concepts.

During much of the show, the four identically dressed performers function as blank canvasses upon which video and light effects are projected. So precisely do these projections remain within the contours of the men's bodies that they seem to change form and substance before our eyes. Some of these transformations attain a meta physical poetry ... the men's bodies are anatomised into pixels of light which pulsate so fiercely that the dancers implode and disappear. (Mackrell, 2003b)

YouTube video footage in Part Two of Vivisector (2010c), presents one man standing still whilst water ripples are projected onto his body, which turn into pixels and then he completely disintegrates. Another man becomes visible, slowly twisting his head to look right and left. A version of himself is projected onto his body but with a black hole on his stomach, which expands and contracts, eventually consuming him. The projection on the third man is a version of himself cracking and then disintegrating into moving fireflies. They buzz around before disappearing (Viennaexile, 2010c).
The fact that these are real people, in real time and space, makes the quality of the illusion more visceral and magical than any computer generated movie stunt. At moments the collaborators intensify the confusion between live and digital by superimposing treated film of the dancers onto their actual bodies, the fit so exact that we do not know if this is a live or a fake performer. (Mackrell, 2003b)

This is especially evident in Part Three when one man is lit as he performs a solo of slow movement that encompasses more complex body positions. The movement is disjointed and, whilst the men take turns to perform little solos, the others are in total blackness except for brief moments where certain body parts are projected onto themselves. For example, we see a pair of jeans, a head, a second head and then a torso floating in space. The precision is incredible. Footage of the men, which has been sped up or slowed down to make the impossible possible is projected onto the men. Two of the men appear to levitate and then their movements alternate between fast forward and rewind, which can be perceived as robots malfunctioning and breaking down (Viennaexile, 2010d).

*Vivisector* is described as examining

the different speeds of people/nature and technology/information society and of their acceleration; an experiment to overcome the space-time continuum in the real world. It breaks the linearity of movement and in doing so shows the absurdity of momentum. ("Vivisector – Intervention of the Sweating Body", n.d.)

We can see the different speeds of the dancers examined in this work with the varying pace of their movement, which is contrasted by the projected images of themselves moving disjointedly and at an inhumanly fast rate in Part Three. The space-time continuum of the real world, in which the audience views *Vivisector*, is warped as a result of the continual conflict of speed between the live and projected dancers. The juxtaposition of the projection and the live dancers also allows the audience to question reality and ponder what is real.

The continuity within the performance is visible from an overall perspective of changing bodies in space rather than individual movements. This is achieved by constant flashing lights in Part Four, (which could represent the "absurdity of momentum") and persistence by the dancer and the viewer is necessary to see the minimal, yet distinctive change. The strobe lighting shows one zone at a time with a man standing looking statuesque. One arm is bent at the elbow and the hand reaches forward from the body. You never see any of the men moving but as the strobe light continues flashing the men's relationships to one another change in the space. The men begin to move into the other dancers' space and the audience can see parts of the body, such as hands, protruding into different light zones. At one point there are three men in one light zone. As the light alternates rapidly, the men's movement is diminished, however, it is the overall
effect of change within the space, which becomes so fascinating. As the men return to their individual light zones, the white light continues to flash and light up their bodies. In the process, a small projection of a chest and stomach is projected onto each man as the strobe subsides and we are left staring at the fixed projection on their stomachs, highlighting the movement of their diaphragms until the projection becomes almost transparent and their stomachs look like pulsing cells (Viennaexile, 2010e).

The layered images in Vivisector are particularly successful in revealing specific body parts whilst concealing others, and the strobe light would be pointless without a live body to light up and produce time warping effects. The concepts of speed and time in space, and the relationship between humans and technology could not be explored in the same way without the presence of the projections and the dancers. This, in my opinion is a strong example demonstrating a critical synergy.

The 360 degree projections utilized in ICH² are slightly more removed from the dancers in terms of proximity. While in many of the works performed by Compagnie Montalvo-Hervieu, the closeness between the live dancer and the projection is essential for maximizing the relationship, the dancers in ICH² are enveloped in a projected world. The images are used on several occasions as a metaphor to being in the character’s mind. A constantly changing environment, which is at times quite surreal, is evident in Scene Three: Memento of ICH². In this scene the live and projected girls appear to wake up from their sleeping positions. The live dancer sits on the edge of the stage facing the closest dome side. The projected girl stands up and starts walking around the edge of the dome and as she passes, sections of the wall fall down backwards and images of different buildings and houses are erected, constantly changing. The live girl follows the projected girl by shuffling her bottom along the edge of the stage and maintaining eye contact with her double. It is almost as if through the performer’s eyes, we as an audience are invited to look into her world. Then the projected girl walks out through a door and disappears leaving the moving buildings. The buildings also circle around as if the dancer is travelling down the street giving the illusion of motion when the dancer is really standing in the same position (Media ICH², 2006c).

Not only are the video projections in ICH² used to create a scenic environment for the audience but they draw the audience’s attention to certain body parts, actions and particular details by showing close ups, multiple copies of the same action, delayed and mirror imaging of the live performer and the projected dancer. This is particularly noticeable in Scene One: Dream. A live female performer watches a replica of herself projected onto the dome wall and, as they both lie down to sleep, the projection changes to an enlarged close up of the sleeping face. The close up of the face allows the audience to see the expression, and subtle twitches that suggest a dream-like state. Once we recognise this state another live performer emerges from the lower level of the stage, directly under the sleeping dancer. Their movements are similar, except the dancer on the higher level only uses her torso and this suggests they are the same person in the dream (Media ICH², 2006a).
As ICH² was developed for a planetarium, Tom Duscher explains in *Behind the Scenes* that "the principle aim of the textual/content-based work was to find a dramaturgic connection between art and science" (Duscher, 2007).

The central theme of ICH² is the projected image of the human, the digital duplication of the self that relates back to early psychoanalytical motifs such as dreams and shadow and to recent developments such as the decoding of the human genome. (Duscher, 2007)

In ICH², Scene Two: *Shadow* makes use of the silhouette lighting to explore the scientific theme of genetic coding. The first live dancer is quite close to the dome wall resulting in a small silhouette. The second dancer is further away from the dome wall and so creates a larger silhouette. This is overlaid with projected copies of the dancers illustrating layers and contrast. Later in this scene, translucent copies of the dancer are replicated higher above the live dancer and are covered with moving genetic code sequences of letters. Replication and imitation of the human figure bring scientific ideas to the forefront of the audience's mind. Although in the excerpt no particular comment on the theme is made, it still raises issues for the audience to ponder about where the human is in relation to science and its progress and what we may achieve (Media ICH², 2006b).

### 2.6 Challenges Associated with the Use of Projected Techniques

When assessing the various techniques of synergies between the visual projection and contemporary dance, I feel that some techniques may be considered easier to produce a critical effectiveness than others. Using techniques such as the layering of images in *D.A.V.E.* and *Vivisector* and, the light images that envelope the dancer in *Glow*, seem perhaps more difficult for the audience to separate the media. The dancer appears 'in the image' and so naturally the images are affected by the figure, which is behind them. In these cases, the synergy is critical because the image and the dancer are linked so closely together and the absence of one or the other would change the outcome for the audience entirely.

I feel that using projection as a backdrop is the most difficult technique by which to create a true synergy between the media. In several cases, this technique can be used to great effect, such as the chase scene in *Paradis*. I perceive a synergy in this example as being the interaction between the projected images and the live performers. However, many choreographers incorporate projected backdrops into their work without establishing a dependent connection between the media. This is evident in the Sydney Dance Company's *360°*, choreographed by Rafael Bonachela. After viewing this performance live, I tried very hard to work out the connection of several large projected goldfish that swam around behind the dancers. The dancers were performing several duo sequences in unison and their movement did not suggest being under water. A collection of images was
Projected throughout the performance including an extreme close-up of a flower and a digitally generated road, which the audience viewed from a speeding driver's perspective. Perhaps the choreographer did have meaning behind these images, however, I felt that they were obscure, unhelpful in giving balance to the dance and did not enhance the concept or relate to the dancers in any way. I believe this is an example where projection has been used for the sake of novelty and has no real purpose, save to provide a moving backdrop.

2.7 The Potential Meaning of Visual Projection in Contemporary Dance Performance

In this day and age, technology is being developed at a rapid rate and in our Western society most people engage with a wide variety of technology on a daily basis. Young children are exposed to computer games, cartoons, and films from an early age. Special effects on the screen continue to become more complex, dynamic and, sometimes include more realistic detail, for example, the fur of digitalised animals. Three dimensional technology utilised in films has also become more popular and wide spread as seen in Avatar, a film combining a mixture of 'real actors' and digitalised creatures (Landau & Cameron, 2009). It is, therefore, not surprising that performances involving technology help to attract a broader audience to dance performances, and theatre alike, particularly young people. The advantage of this is also an increase in ticket sales.

William Dudley, a stage designer who has embraced video projection technology is quoted in SET DESIGN: Stage of the art.

> Young people can find theatre very static and one of the things digital technology can do is to bring epic movement back to the theatre ... It's like someone taking the audience through a big, animated computer game. I suppose we're feeding off the effects-based film and computer game industries, but if it serves the theatre well, then that's all for the good. (In Smurthwaite, 2006).

Visual projection and imagery can appeal to a broader range of people, as there are more dimensions in the performance. This allows people to connect with the piece on many different levels. While one person may find dance quite abstract and hard to understand, the visual projection may add to the movement and help to clarify the theme or give meaning to the work. One viewer may have a particular interest in the technological aspects of a production and how the overall effects are achieved, whilst another person may be well acquainted with dance and the projection might purely increase their appreciation for the visual beauty of shape and lines, relationships and what the human body is capable of.

Finnan strives for visual innovation, strongly utilising film and projection alongside the dancers.
Each of these elements contributes to the overall aim of realising a total performance experience with which the audience can engage at any level: from the strength of the visual imagery; through to the physicality, formal qualities and technical skill of the dancing; to the ideas, narratives and human concerns that inform and inspire the work. (Motionhouse Dance Theatre Student Pack, n.d. p.4)

With the inclusion of high-tech motion capture technology, the potential for creating a real-time live experience for the audience is made possible. In a review of Mortal Engine, Grundy (2008) explains that "Part of the show's appeal is its 'live' aspect. Although the scenes remain in the same order, the movement of the dancers (and the effects they trigger) are never the same." Obarzanek informs us that "[t]he performer is free onstage, and the system responds to them. That allows the performers to create the sense that this is happening now: it's never happened this way before and it won't happen the same way again" (Grundy 2008).

Many artists aim to take the audience on a journey into a land of fantasy and fiction. Is video the key to making this possible? It is a difficult question and one that I believe cannot be resolved with a definite answer. It is true that people are drawn into other worlds through watching video and many people feel that film adds a sense of the imagery being real.

From my research, I have found that not everyone is so thrilled about the use of visual projection and film in cohesion with dance performance, believing that the imagery detracts from the purity of the dance. Many other artists, however, are willing to embrace the technology to further develop their art practice, creating a synergy between the media and expanding upon ideas and concepts.

3. Conclusion

Projected imagery including pre-rendered footage, abstract light images derived from motion-capture technology, still images and manipulated images are becoming more common in fusion with contemporary dance performance. Significant advancements in lighting technology have been made since Loïe Fuller began experimenting with light during the late 1800s and film has seen a transition from black and white footage to colour, through video recording, to the digital era. Motion capture technology has also progressed from reading information from a series of electrodes attached to the performers to analysing infrared camera data in order to generate a visual response.

Choreographers have helped to develop technology in many cases by imagining how the dancers could interact with an image or light source and then employing designers to create software programmes that are capable of presenting these ideas.
There have been many successful collaborations between choreographers, dancers and multimedia designers, creating a variety of contemporary performances where the projected imagery is fully synergised with the dancer. Some productions are of course more successful in generating an interdependency than others and I believe that if one media does dominate (producing an unsuccessful synergy), then the audience will choose to focus their attention towards one medium or the other.

When examining the above examples, I felt that in almost all of these cases a synergy was achieved and in fact was critical to the audience's appreciation and understanding of the work. Interdependence between the media is one of the most important factors in achieving a synergised performance outcome and is evident in works that demonstrate relationships, interaction, strengthened themes, concepts and stories or provide context between the media. The positioning of the visual media in relation to the dancer/s is also an important factor, which can determine the success of producing a dependent synergy.

If one does try to remove the visual projection from the dancing, I imagine that the movement would not have as strong an impact. In the case of Glow, the dancer could still perform the same choreography without the moving light images, however, the relationship between the image and the dancer, which demonstrated an alternating grasp of power between the media, would no longer exist.

In the case of D.A.V.E. the imagery is so imbedded in the dancer that the removal of these projections would make the same illusions impossible to create. In this sense I think it fair to say that the synergy is a critical one. Here, the factor that is called into effect is the precision of layering images on top of a live dancer. Obermaier and Haring also explore this idea in Vivisector. The layers are particularly successful in revealing specific body parts whilst concealing others and manipulating the image to portray grotesque and distorted products.

Many of Compagnie Montalvo-Hervieu's works contain scenes that utilise the projection to form a backdrop or environment. However, the projection of animals in Paradis for a chase scene are critical in providing a synergy, for what good would a one sided chase scene be, if it were only performed by the live dancers? Compagnie Montalvo-Hervieu uses pre-rendered video and the dancers must practice the choreography with the projected film many times to give the impression that what is happening is a truly live response from both the live performer as well as the projected animal. The unrealistic nature of the videos, almost always incorporating animals, sometimes playing on clouds, flying through the air, and the distortion of the natural size of the creatures suggests a light hearted, fantasy. It is ironic because the audience recognises all of the images but they are persuaded into fashioning something extraordinary. In these cases, the imagery is essential to provide a point of interaction and to influence the viewer's perception.

ICH², uses the projected film as a 360 degree backdrop that encompasses the dancer and the audience. Techniques such as close ups of faces are included to
highlight expression and states of being. The imagery leads us on a journey and we are able to explore facets of the dancers' minds that would have remained hidden without the aid of the film.

Many of the dance works that I have investigated incorporate a range of techniques to explore the relationships between multimedia. The use of these techniques is important for illustrating factors that indicate a critical relationship between the projected media and the dancing figures. I look forward to the future development of technology, allowing the synergy between visual projection and dance to be explored in new and unexpected ways.
4. Bibliography


Video Files:


