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**Chaos and Context: Speculations about the prominence of
participatory art since the mid 1990s**

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Declaration: This work has not been submitted in whole or in part for the award of any degree at another institution, and is my own unaided work. Each significant contribution to, and quotation from the work of other people has been attributed, cited and referenced.

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Danke Mama und Dada

Hugo, merci 😊

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Abstract

In his essay *The Poetics of the Open Work*, Umberto Eco suggests that 'open work' of the 1960s, which stressed audience involvement, contingency and an anti-institutional stance, is an expression of a Quantum paradigm. Here, the irrationality and lack of order of Quantum Theory is seen as paralleled in artistic expression. Since the mid 1990s, participatory art has gained prominence, both in terms of current art production and retrospectives of Dadaist and 1960s 'open work'. Using Eco's essay as a model, this could be seen as a result of the progression of a Quantum Theory worldview to a view that is understood in terms of Chaos Theory.

The patterns that mathematical models such as natural numbers, Calculus, Statistical Mathematics and Quantum Theory propose have parallels in social and artistic expression. In an extension of this, Chaos Theory is the latest mathematical model that social and artistic trends express. This is suggested by the mirroring of Chaos patterns in current social phenomena such as the Internet and experience economy. The similarity in approach between social phenomena and participatory art suggests that they answer the same social/audience demands. My primary contention is that the environment in which audiences and artists currently operate is such that demands and expectations raised by Chaos Theory are answered by participatory art, just as they are answered by wider social trends. The primary Chaos patterns that can be observed are interconnection, phase change and feedback. This is not a matter of a linear influence of cause and effect. It is not that Chaos inspires certain characteristics which are then expressed in various social phenomena. Rather, encountering Chaos characteristics in daily life raises expectations that these characteristics will be encountered elsewhere. We are thus not speaking of a causative relation between Chaos theory and social phenomena. Rather, there is a complex pattern of escalation which encourages interaction, feedback and phase change in a dynamic, chiasmic system which itself can best be analysed as another Chaos phenomenon.

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Foreword

For some two and a half decades my profession was that of painter, producing artworks to exhibit and sell in galleries. Around me, however, I witnessed the growth of an art form which was radically dissimilar in approach: it did not result in objects and engaged its audience in a very different manner to the traditional gallery show. This dissertation is the result of a fascination with why this participatory art gained prominence from the 1990s onward.

Calling it participatory art makes it clear that sharing is key to this mode of working, with social and community based acts of communication, collaboration and intervention constituting the artworks. Why did this trend arise? My research showed interconnection and feedback to be the common denominator, and it is these concepts which form the backbone of this project¹. I explore how these two characteristics run as strains though the current social and artistic context. In doing so, I aim to show that in the current social paradigm, is such that the participatory mode of working makes sense in terms of what audiences experience and expect in daily life, as in the arts. This essay is by no means a comprehensive or definitive account of various manifestations of interaction and feedback. If interaction and feedback form my lens, then numerous other lenses exist through which this work can be (and is) interpreted².

A few of the generalisations I make in the dissertation do need qualification. I use the term net-citizen to remind the reader that I am speaking about a specific context of the developed, web-enabled public. I by no means want to suggest that the essay's discussions apply universally, and I do take cognisance of the digital divide and of the many countries which block or filter information on the web. This essay paints a broad picture, looking at general trends. While art projects exist which contradict my arguments, I believe that the overarching view presented forms a valid lens. I analyse examples in which the focus is on the participatory, leaving aside some aspects of the artworks that are not relevant to this discussion³.

¹ Whilst later in this dissertation I consider feedback as defined by Chaos Theory, here I use the term more broadly to include the general ideas of interconnectedness, active engagement and a non-hierarchical, networked approach within dynamic systems.

² See, amongst others: Gene Ray's reading of participatory art as counter-capitalist political expression, Brian Holmes' understanding of the participatory as an embracing of global capitalism and Nicolas Bourriaud's analysis of the participatory in terms of cultural sampling.

Gene Ray, "Another (Art) World is Possible: Theorising Oppositional Convergence," *Third Text* Vol. 18 Iss. 6 (2004): 565 – 572. Brian Holmes, "Artistic Autonomy and the Communication Society," *Third Text* Vol. 18, Iss. 6 (2004): 547 – 555. Nicolas Bourriaud, *Postproduction: Culture as Screenplay – How Art Programs the World*, trans. Caroline Schneider. (New York: Lukas and Steinberg, 2002).

³ Claire Bishop has criticised Nicolas Bourriaud for discussing work he calls Relational Art only in terms of the participatory aspect of the work.

Claire Bishop "Antagonism and Relational Aesthetics," *October* 110 (Fall 2004): 65.

The complexity of my argument forces me similarly to lay aside some of the wider messages and nuances of the art projects I mention.

Critical social analysis often assumes a zero-sum game. The concept of the zero-sum presupposes that you are either a winner or a loser, rather than allowing for gradations. This is suggested by the heavily overused phrase 'win-win situation'. George Bush's famous statement "either you are with us, or you are with the terrorists" is an example of such a zero-sum standpoint. While I take cognisance of critiques of current market trends and Internet use, I write this essay assuming a non-zero-sum attitude. On a few occasions I refer in footnotes to criticisms, but I consider the ideological question of who is a 'winner' and who a 'loser' in relation to the Internet, experience culture and participatory art as outside the scope of this inquiry.

This essay discusses aspects of Chaos Theory, the Internet and post-industrial economies. Importantly, I do not suggest that the general public is necessarily aware of and engaged with these phenomena. My view is rather that oversimplified understandings and expressions of these have infiltrated our way of life to the extent that their inherent characteristics are expressed in how society, and hence artists, think and act. Aspects of Chaos Theory and user-produced Internet content have received disproportionate attention in the media. Take, for instance, the number of popular-science publications which focus on aspects of Chaos Theory, or the host of news and magazine articles on user-produced content. Some of the statements I make might thus represent popular rhetoric, rather than actual usage.

I chose to use the term 'participatory' for the type of art I discuss. There is some shared understanding of characteristics of this art among writers, but there is no common name by which it is referred to. Relational Aesthetics (Nicolas Bourriaud), Conversational Art (Homi K Bhaba), dialogue-based public art (Tom Finkelpearl), Dialogical Art (Grant Kester) and Participatory Art (Claire Bishop) are just some of the names given to this trend. Deciding on participatory art was more or less an arbitrary choice; in common with the other descriptors, it suggests activity and interaction.

Introduction

One of the greatest efforts in philosophy and art of modern times has been devoted to overcoming the limits of representation.⁴

My art is like the light in the fridge, it only works when people open the fridge door.⁵

Throughout the history of art, the separation between artist and audience, producer and viewer has come under acute scrutiny. From Dadaism (1910s to early 1920s), to Fluxus (late 1950s to 1960s), Act Up (1980 to 1990s) and beyond, artists approached the avant-garde project by problematising the position and definition of the author and, concomitantly, the role of the spectator. Since the late twentieth century there has been a resurgent focus on art which encourages active engagement and contribution by audience members. This essay speculates on a possible reason for renewed prominence of the participatory. I suggest that during the period in question, Chaos Theory infuses social ways of being and thinking to the extent that this Theory has become a significant construct that frames social and artistic expression.

To contextualise this discussion, let us briefly look at some examples of artists and art movements since the mid 1800s that encouraged audience involvement⁶. As early as 1848 Richard Wagner called for artists to work in fellowships which would strive for a (communist) unity between art and the people. The artist, through using the format of the *Gesamtkunstwerk*, sought to bring about a dramatic synthesis that would unite actors and audiences. For Wagner, the erasure of the individual author was a symbolic act, represented by the literal death of the thespian hero (as emblematic of the artist). The audience's participation was thus not actually realised, but was implied through this staged demise⁷.

In the early twentieth century, various artistic movements – most famously Dadaism – engaged audiences through scandal and provocation, at times even attacking audience members physically to force a reaction from traditionally passive spectators. Art here was no longer a finite object but a collaborative experience formed by artists with the unwitting or conscious

⁴ Barbara Bolt. *Art Beyond Representation: The Performative Power of the Image* (New York: I.B. Tauris, 2004), 13.

⁵ Liam Gillick quoted in Bishop, "Antagonism and Relational Aesthetics," 61.

⁶ Audience participation was the *raison d'être* for most pre-modern European and traditional African and Asian art. In temples, cathedrals and rituals art was an embodiment of spirits and gods.

Boris Groys, "A Genealogy of Participatory Art," in *The Art of Participation: 1950 to Now*, ed. Rudolf Frieling (New York: Thames and Hudson Inc, 2008), 20.

The interpretations, use and engagement with such art were tightly scripted, unlike the manifestations of participatory art I consider in this essay.

⁷ Boris Groys, 22.

Ironically Tolstoy considered Wagner's *Gesamtkunstwerke* as unintelligible (*Ibid.* 24). I think many of us would sympathise with his inability to participate. It is also telling that the Wagnerian was later adopted by Fascism as a bulwark against Communism.

intervention of viewers, other artists and passers-by. A less alienating stance was adopted by Russian avant-gardes roughly contemporary to Dadaism; these attempted to activate and include the broader masses through and in their agitprop art. Unlike the Wagnerian tragedy of the dying artist/hero who must succumb for the greater good, most Soviet art celebrated the subsuming of the individual as an exuberant expression of collective *joie de vivre*⁸.

After the formalism of mid-century High Modernism, the 1960s saw an explosion of 'open work'. to use Umberto Eco's term, which functioned outside traditional art media and refocused the debate around participation and viewer involvement⁹. In Happenings and performances by Fluxus, Situationist International, MTAA and others, artists in a carnivalesque manner embraced working across media and disciplines, collaborating and participating with audiences and fellow artists. With the discrediting of agitprop art due to its recent links with fascism, state communism or government propaganda, artists of this era frequently embraced a broadly utopian oppositional stance¹⁰. This stance was based mostly on identity and class, and operated within a general context of radical political upheavals. The approaches and hoped-for outcomes were numerous: from the celebrity-driven idealism of Joseph Beuys to therapy-like group sessions organised by Lygia Clarke and overtly menacing and confrontational pieces such as Yoko Ono's



Yoko Ono, *Cut Piece* (1965)
Performance at Carnegie Hall, New York¹¹.

justifiably seminal *Cut Piece*¹¹. The provocation of Dadaism was carried further in works which emotionally and physically challenged the audience participants such as Chris Burden's *Back to You*. For this 1974 performance, a volunteering audience member stuck pins into the artist's body while the rest of the audience witnessed the act on television monitors¹².

In the mid 1990s a number of authors, theorists and artists proclaimed a 'new' manifestation of the impulse to the 'open work'. This was expressed in a rejection of the gestural, machismo paintings (Julian Schnabel, Jörg Immendorf and Anselm Kiefer), postmodern in-jokes (Cindy Sherman, Sherrie Levine and Jeff Koons) and YBA commercialism which dominated the art scene from the 1980s to early 1990s. A substantial number of artists returned to modes of

⁸ Boris Groys, 27.

⁹ Umberto Eco, "The Poetics of the Open Work", in *Participation: Documents of Contemporary Art*, ed. Claire Bishop (Cambridge: MIT & London: Whitechapel, 2006).

¹⁰ Rudolf Fneling, "Toward Participation in Art," in *The Art of Participation: 1950 to Now*, ed. Rudolf Fneling (New York: Thames and Hudson Inc, 2008), 39.

This ideological utopianism was grounded in Marxism and critical theory and sought changes in society and its institutions, in contrast to the transcendental utopian urge of movements such as German Romanticism.

¹¹ Yoko Ono's instruction for *Cut Piece* read: "Performer sits on stage with a pair of scissors placed in front of (her). It is announced that members of the audience may come on stage – one at a time – to cut a small piece of the performer's clothing to take with them. Performer remains motionless throughout the piece. Piece ends at the performer's option". Ono presented *Cut Piece* in 1964, 1965 and, with slight changes, in 2003.

Ibid., 108-9.

¹² *Ibid.*, 109.

¹³ Rudolf Fneling, ed., *The Art of Participation: 1950 to Now* (New York: Thames and Hudson Inc, 2008), 109.

working which involved audience participation and encouraged contingency and context-dependency.

The list of artists working in this vein since the mid 1990s is considerable. Julia Svetlichnaja underscores the adoption of this trend by stating that nearly all participatory artists (she uses the term 'relational') are highly successful in the current art scene¹⁴. In conjunction with artists' 'reinvention' of the open work, a huge number of publications and curatorial projects have refocused attention on the art of the 1960s and 1970s. James Meyer describes the contemporary fascination with the 1960s as "indubitably, excessively pervasive" and occurring in all facets of the art world, namely "art making, curation, art history, the market"¹⁵. Meyer lists nine large-scale exhibitions hosted at major North American galleries between 2002 and 2004 which bear out this trend, but the list could be far longer for galleries in the United States as well as in other countries¹⁶. A similar wealth of conferences, curatorial projects and publications have recently focused on Dadaism which, as indicated earlier, shares the participatory characteristics of 'open work'. In short: since the last decade of the twentieth century, the art world has experienced a near-obsession with currently and historically produced art that is what I term participatory.

We look now to Nicolas Bourriaud for a definition of the participatory. Claire Doherty describes Nicolas Bourriaud as the critic who "offered one of the earliest readings of the[se] emergent new forms of artistic production" with his *Esthétique Relationnelle* (1998), published in 2002 in English as *Relational Aesthetics*¹⁷. Bourriaud defines this art as modelling and encouraging human interactions within environments that echo, or are located in, the general social context. He defines Relational Aesthetics as an "aesthetic theory consisting in judging artworks on the basis of the inter-human relations which they represent, produce or prompt"¹⁸. Crucially, participatory artworks do not exist independently of social engagement, but are both formulated and constituted by it. The artist might set up an environment for a project, but within these parameters it is the participants who collectively shape, create and execute the work through their interactions¹⁹. Often, the participants do not only contribute to the artwork. Their participation, enabled by the scenario or context provided by the artist, *is* the artwork. Stated

¹⁴ Julia Svetlichnaja, "Relational Paradise as Delusional Democracy: A Critical Response to Temporary Contemporary Relational Aesthetics," (paper presented at the *Art and Politics* panel, BISA Conference, University of St Andrews, St Andrews, Scotland, December 19 – 21 2005), http://www.wmin.ac.uk/ssh/docs/jus_relational_paradise.doc [accessed 18 March 2008].

¹⁵ James Meyer, "The Return of the Sixties in Contemporary Art and Criticism," in *Antimonies of Art and Culture: Modernity, Postmodernity, Contemporaneity*, ed. Terry Smith, Okwui Enwezor, Nancy Condee (Durham: Duke University Press. 2009). 322, 325 & 328.

¹⁶ *Ibid.*, 331 -2.

Meyer lists: "A Minimal Future?" Los Angeles Museum for Contemporary Art, March 14 – August 2, 2004; "Donald Judd," Tate Modern, February 5 – April 25 2004; "Robert Smithson," Los Angeles Museum of Contemporary Art, September 12 – December 13, 2004; "Dan Flavin: A Retrospective," October 17 – January 2; "Lee Bontecou: A Retrospective," UCLA Hammer Museum, October 5, 2003 – January 11, 2004; "Cotton Puffs, Q-tips, Smoke and Mirrors: The Drawings of Ed Ruscha," Whitney Museum of American Art, June 24 – September 26, 2004; "A Short History of Performance, Parts I and II," Whitechapel Gallery, April 15 – 21, 2002, and November 18 – 23, 2003.

¹⁷ Claire Doherty, ed., *Contemporary Art: From Studio to Situation* (London: Black Dog, 2004), 43. Nicolas Bourriaud, *Relational Aesthetics*, trans. Simon Pleasance and Fronza Woods with the participation of Mathieu Copeland (Dijon: Les Presses du Réel, 2002). Bourriaud first used this term in the 1996 catalogue for an exhibition titled *Traffic*.

¹⁸ Nicolas Bourriaud, *Relational Aesthetics*. 107.

¹⁹ Some of these artworks incorporate artist-determined rules whilst most determine rules collectively.

simplistically, there is no division between creators and receivers: the audience both creates and witnesses the art project, while the artists are both enablers and spectators of such an audience²⁰.

The above description forms a basis for defining participatory projects. As I indicated earlier, however, this trend has many names and many different interpretations. There are some broad common characteristics – participation, a basis in lived experience and engagement with social context – but participatory art's tendencies to open-endedness, context-dependency and a 'work in progress' attitude result in widely diverse expressions of the interactive form. Indeed, some of the artists who recognise the collaborative nature of their artistic practices refuse to be seen as part of a trend or movement, often because their intent is precisely to work against high art's need to locate work in a historical trajectory²¹.

As stated previously, this dissertation attempts to show that the constructs which have governed social thought and action since the late twentieth century are such that participatory art both reflects and makes sense in this context. These constructs are partly constituted by Chaos Theory because of this theory's prominence in the way our society functions. The hypothesis is that Chaos Theory encourages social memes which are observed in participatory art and in wider social phenomena²². Although the general public is not necessarily aware of or engaged with Chaos theory, much of what people currently do and think reflects a Chaos approach. Certain characteristics of Chaos are expressed in the subliminal framework of how society and artists think and act.

To argue a link between Chaos and social and artistic expression, I use Umberto Eco's 1962 essay *The Poetics of the Open Work*. In this essay, Eco linked Quantum Theory with 'open work' art of the 1960s. He argued that what he called 'open work' – art which allows multiple interpretations and encourages audience intervention – worked within a Quantum Theory paradigm²³.

The aim of this essay is to extend Eco's argument by suggesting that the shift from a Quantum framework to a Chaos framework is observable in social and artistic expression. I argue that aspects of Chaos Theory – with interaction, feedback and phase change as facets – have become culturally dominant to the extent that these principles are now reflected in mainstream ways of being and thinking. If contemporary society, consciously or not, readily draws on Chaos principles due to the ubiquity of this mode of thinking, then this is surely as much the case for contemporary artists and audiences. Eco wrote about the 'open work' as a mode of expression chosen by artists who work in a framework that Quantum thought influences. I hypothesise that,

²⁰ Practically, however, artists working in the participatory mode are, with few exceptions, 'big names' in the art industry and audience participants are not always aware that their input is part of an art project.

²¹ The artists' presence in this document indicates otherwise. Ben Lewis, director of a BBC documentary on Relational Art, describes UK-based artist Liam Gillick as "absolutely livid" when asked about his inclusion in Nicolas Bourriaud's book *Relational Aesthetics*.

Ben Lewis, "Interview.Discuss: Is Relational Art a New Movement?" BBC4, <http://www.bbc.co.uk/bbcfour/documentaries/features/art-safari1-int.shtml> [accessed 20 March 2008]

²² Memes are a construct to describe cultural ideas, symbols and practices. Memes can be any social expression or belief, such as social values, greeting conventions or lullabies (Richard Dawkins contending that religion falls into this class as well). They replicate much like genes do, being handed down from generation to generation and between individuals. The concept was invented by Dawkins to illustrate how similar the patterns of propagation of social constructs are to the way genes propagate. In this way, successful memes continue to evolve, whilst unsuccessful ones are discarded.

Richard Dawkins, *The Selfish Gene* (New York: Oxford University Press, 2006), 189 – 202.

²³ Umberto Eco in Bishop, *Participation*, 20 – 40.

over forty years after Eco wrote his essay, the extension of Quantum to a Chaos paradigm could indicate a reason for the renewed prominence of participatory art, precisely because this art addresses the needs, desires and understanding of a contemporary audience.

Let me reiterate that this is not to suggest a public consciousness of Chaos Theory. Society generally still views the theory as esoteric material for a few enlightened scientists. The argument is not that people are familiar with, or understand Chaos Theory directly, but rather that the ways of thinking of Chaos have infiltrated mainstream society to the extent that the interconnectedness, phase change and feedback of Chaos are directly echoed in contemporary understandings and approaches to being in this world – that is, in social memes.

Before proceeding to a detailed outline of my project, I want to very briefly mention the contentious question of whether participatory art is a 'mere' rehashing of the radical artistic production of the 1960s, as some writers suggest. Much ink, and bandwidth, has been used to debate the newness of participatory art. Commentators question whether it forms part of a continuum starting with Dadaism, or whether it is a restaging of the open works of the 1960s²⁴. Certainly, the context of the contemporary media-connected society linked by global real-time communication networks was imagined by some artists of the 1960s and 1970s (see for instance Nam June Paik who first conceptualised the "Electronic Superhighway" in 1974²⁵), but it only found realisation in the last two decades. This means that for the first time a generation exists which has experienced digital global connectivity for all of their lives.

Let me briefly point to some differences between the expression of participatory art in the 1960s and 1970s and the expression of participatory art from the 1990s onwards, other than the above-mentioned contextual distinction. Speaking very generally, many historical expressions of 'open art' operated outside the museum context with an anti-institutional stance. In contrast, contemporary manifestations of such practices are mostly sanctioned or financially supported by museums or prominent galleries, and often take place within these. Whilst many artists from the 1960s and 1970s expressed an avoidance of commercial institutional links, contemporary participatory artists tend to see themselves as highly professional and knowledgeable about technology, business and communication. They often manage complex, highly nuanced projects²⁶. Julia Svetlichnaja disapprovingly puts it thus: "the ultimate aim of (...) the 'historical avant-garde' in general has been to integrate art into the *Lebenswelt*, into society and everyday life. What Relational Art attempts to do is to integrate everyday life into art"²⁷.

Art in the 1960s and 1970s was dominated by ideological stances, engaging Marxism and critical theory. A number of current participatory artists proclaim an interest in social agendas, but most of this social commentary focuses on celebratory engagement rather than activist

²⁴ See amongst others: George Baker, "Introduction," *October* 110 (Fall 2004): 50. Anthony Downey, "Towards a Politics of (Relational) Aesthetics," *Third Text* Vol. 21 Iss. 3 (May 2007): 267 -275. Lora Bang Larsen, "Social Aesthetics," in *Participation: Documents in Contemporary Art*, ed. Claire Bishop (Cambridge: MIT Press, 2006).

²⁵ Rudolf Frieing, "Introduction," in *The Art of Participation: 1950 to Now*, ed. Rudolf Frieing (New York: Thames and Hudson Inc, 2008), 14.

²⁶ Art groupings such as the Situationist International embody the trend towards anti-institutionalism in the arts of the 1960s to 70's. Artists such as Christine Hill, who ran a functional franchise chain of second-hand clothing shops and a travel agency as artworks, in effect copies commercial institutions exactly.

See Barbara Steiner, ed., *Inventory: The work of Christine Hill and Volksboutique*. (Ostfildern-Ruit: Hatje Cantz, 2003).

²⁷ Julia Svetlichnaja. 10.

oppositional positions. Antisocial provocation and scandal characterised much – though by no means all – art of the 1960s, whilst current participatory art tends to stress co-operation. As an example, the website information about a 2007 conference on participatory work provided information under the title “Be Real, Play Nice”²⁸. This echoes Bourriaud’s view that art is no longer about projecting utopian future ideals, but rather about exploring local, temporal solutions²⁹. This shift away from large-scale antagonistic ambitions for art has to be understood in terms of scepticism in light of the historical failure of the avant garde transgressive programme. Such artistic programmes invariably ended up co-opted into the very systems they set out to critique.

What is notable and to me fascinating, irrespective of the newness of this ‘new’ art, is the widespread championing in the 1990s and early 2000s of this mode of working and a strong resurgent interest in similar art from previous eras. The point of this essay is not to debate the uniqueness (or not) of artistic expression of these artists; rather I want to consider what in the current milieu encouraged artists to work (or work again) in this manner and curators to highlight contemporary and historical participatory art. Why have there been so many exhibitions on this kind of art since the mid 1990s?

This dissertation is divided into two sections, with Section 1 setting out my thesis and Section 2 using further examples to illustrate this hypothesis. Chapter 1 illustrates a historical correlation between social constructs, artistic expression and mathematical conceptions. There, I suggest that mathematical developments are one lens through which one can observe and explain paradigmatic shifts in social memes, and consequent changes in artistic expression.

The second chapter reviews Umberto Eco’s use of Quantum Theory as a lens through which to understand ‘open work’ of the 1960s. This dissertation is modelled on Eco’s approach and extends his thought into the current Chaos-driven context.

Chapter 3 develops the train of thought started in Chapter 1 by suggesting that a recent development in mathematical thought, Chaos Theory, can be used as a lens for understanding the current trend towards participatory art projects. This chapter introduces the three Chaos characteristics which inform all subsequent discussions in this essay. These are (most prominently) interconnection and feedback, with phase change forming the third, somewhat less important characteristic. Chapter 4 discusses how the three Chaos characteristics mentioned in Chapter 3 are observable in participatory art projects.

Section 2 lists examples to support the general contention of this essay. The discussions in Chapters 5 to 7 reflect commonly mentioned contextual parallels to participatory art. Numerous writers indicate that the Internet and globalised entertainment economy are critical to the development of participatory art, but researchers seldom deal with this explicitly as I attempt to do here³⁰. In Section 2 I discuss the Internet and shifts to a globalised experience economy as parallel expressions of the model of Chaos. The World Wide Web, and hence the Internet, cannot exist outside a Chaos paradigm. Similarly, the recent growth of the experience economy relies on the Internet. In this discussion, I show that the environment in which audiences and

²⁸ Jennifer Delos Reyes, “Open Engagement: Art after Aesthetic Distance,” (2007), <http://jendelosreyes.com/openengagement/about.html> [accessed May 18 2008].

²⁹ See: Nicolas Bourriaud, *Relational Aesthetics*, 28, 36, 46. Okwui Enwezor, et al. eds., *Democracy Unrealised: Documenta II – Platform 1* (Kassel: Hatje Katz, 2002), 79 – 95. Ulrich Beck et al. eds., *Reflexive Modernisation: Politics, Tradition and Aesthetics in the Modern Social Order* (Stanford CA: Stanford University Press, 1994).

³⁰ See: Maria Fernández, “Postcolonial Media Theory,” *Third Text* Vol. 47 (Summer 1999): 11.

artists currently function is such that the characteristics of participatory art answer the demands and expectations raised by Chaos, and are also echoed in the wider social phenomena of the Internet, globalisation and experience economy. To show this, Chapter 5 looks at information production and dissemination via the Internet. Parallels between prominent characteristics of the Internet, participatory art and Chaos theory are highlighted to illustrate that these Chaos characteristics inform the current social milieu and hence find wide social expression, including in the arts.

Chapter 6 expands this by considering social networking sites, analysing these as an expression of a contemporary obsession with the self as existing in and through a social network. This is again related to participatory art and to Chaos Theory. In a similar manner, Chapter 7 looks at participatory art and wider social phenomena as an expression of Chaos by considering parallels between art, Chaos and experience-based economies. This is followed by a brief conclusion.

The argument in this dissertation is not a causative one: I do not contend that the development of a Chaos paradigm, digital technology and altered economic relations influenced or determined the prominence of the participatory. Instead I suggest that the assumptions and needs which led to the advancement of the mathematics and philosophy of Chaos Theory saw a parallel growth in art and culture. This parallel growth is expressed in the arts through the participatory. To reiterate this critical point: I argue that, through this lens, the shift to a Chaos paradigm is one common driver that the Internet, experience economies and participatory art all share. The Internet and changes in the economy did not influence participatory art, but Chaos Theory introduced certain assumptions. It is these assumptions which partly underlie and make the Internet, the service economy and participatory art significant.

Section 1

Chapter 1: Mathematical Conceptions and Artistic Imaginings

Whilst this is an art history paper, I start of *Section One* with a discussion around the development of mathematics. In doing so I want to introduce the idea that there is a direct (though complicated) relationship between mathematical models, social paradigms and artistic expressions. What is accepted as art is not arbitrary, but is shaped and anticipated by expectations, rewards and attention. Each context has preconceived possibilities as frameworks which do, or do not, allow something to be accommodated into the rubric of 'art'. The larger framework, the *Weltanschauung*, within which we as societies function, sets a limit to what we accept as art. Whilst this is true of art, it is also true of other forms of social expression. Mathematics and the philosophy of mathematics is one contributor to the construction of such frameworks. This dissertation uses mathematics as a lens through which to explain the recent prominence of participatory art.

The development of mathematics and its relation to social memes is complex, so a detailed consideration is beyond the scope of this essay. Nonetheless, a summary of some important points follows. Mathematics counts and measures the relations, motions and shapes of objects, but a mathematician's concerns mainly lie with investigating those physical objects that his or her society regularly encounters and is familiar with. In an unavoidable interplay, mathematical models are discovered to solve problems lying in the way of social development, and in turn these new mathematical constructs raise other problems. For example, if counting the number of sheep at a rural trade fair is the main occupation of a society, a grasp of natural numbers will suffice, but following the intricate fluctuations of a global market requires a completely different mathematical understanding. In turn, global economic systems could only develop in the first place because advancements in mathematics allowed for the functioning of such complex systems. This means that looking at the history of mathematics shows one a direct correlation between the kinds of questions being asked of the universe, the mathematical models developed, and the needs and lifestyles of societies. One of the main drivers in people's ability to abstract their environment into meaningful models is the mathematical conceptual frameworks available, so that a society's mathematical models reflect the way in which contemporary cultures view reality. Insofar as art is always and unavoidably an expression (whether an embracing or criticism) of a particular social environment, the way in which artistic forms are structured mimics and reinforces the contemporary culture's worldview³¹.

A brief excursion through mathematical history illustrates the close interweaving between social constructs, mathematical understandings and artistic expression. My approach here is to mention prime characteristic of five mathematical models – natural numbers, Calculus, Statistical Mathematics, Quantum Theory and Chaos Theory – and to link these to everyday phenomena. In the case of natural numbers, Calculus and Statistical Mathematics I also

³¹ Umberto Eco in Bishop, *Participation*, 31.

mention a parallel in art. This will form the basis of a more detailed comparison in Chapters 2 and 3 between Quantum and Chaos Theory and their expressions in the everyday and the arts.

Let us start by considering characteristics of mathematical models based on natural numbers, their use in addressing daily concerns and the expression of these mathematical models in the arts. From the Late Bronze/ Early Iron Age until well into the Medieval period human economic activities were primarily trade, agriculture and compressive building. Such activities required natural numbers and geometry, which dealt with counting finite, specific and complete elements.



Bible moralisée. *God the Father Measures the World*.
Around 1250. Vienna. Österreichische Nationalbibliothek³⁴.

Evidence of this understanding can be found in contemporaneous texts and engineering and architectural projects, where natural numbers and geometry were adequate for the practicalities of life. These included the building of houses, laying out of towns, gathering of taxes and division of land into fields. In turn artistic expression was based on a recounting of the known³². Mythical or religious symbolism such as in the thirteenth century illumination *God the Father Measures the World*, housed in the collection of the Österreichische Nationalbibliothek, would fall into this understanding of the known as these narratives were seen as finite and complete, rather than discursive and open to development or re-interpretation³⁵. In this framework, both mathematical and artistic constructs employed bounded, finite and specific elements.

The next mathematical development I want to consider is that of Newtonian Calculus, again with the aim to show how Calculus is reflected in social models and in the arts. The Age of Enlightenment broke new boundaries, not only in human thought, but in the ability to calculate advanced sums. In this age Newton was not only a mathematician but a philosopher, understanding the strong link between Enlightenment concepts and mathematics. Newton's Calculus is a mathematical technique which allows complex phenomena to be broken into small, simplified components of a continuum – through disregarding the 'distraction' of friction – which can be manipulated mathematically and the results integrated to give a solution to an overall problem. Calculus edits out complications and places the remaining information into rational relation. Newton's rational, idealised and abstracted mathematics made the universe seem an orderly place, where objects moved in straight lines or perfect curves, without the interference and complication of friction³⁶.

Calculus allowed for the modelling of the solar system, supporting the huge step that the move from an earth-centric universe implied in the development of human thought and in the arts. Calculus also set up the framework for engineering, allowing the modelling of such diverse

³² John Gribbin, *Deep Simplicity: Chaos, Complexity and the Emergence of Life* (London: Penguin Books, 2005), 5. David Berlinski, *Infinite Ascent: A Short History of Mathematics* (New York: Random House, 2008), 29, 132, 155. Wikipedia 'Mathematics' 12 September 2009, <http://en.wikipedia.org/wiki/Mathematics> [12 February 2009].

³⁵ Umberto Eco in Bishop, *Participation*, 25.

³⁴ Rolf Toman, *Romanesque: Architecture, Sculpture, Painting* (Königswinter: Könemann, 2004), 448.

³⁶ John Gribbin, 13 - 14. David Berlinski, 47 - 48, 57, 59 - 60. Wikipedia "Mathematics," [12 February 2009].

physical phenomena as thermal gas expansion, energy movements and stress calculation, which eventually powered the Industrial Revolution³⁶.

This sense of order and rationality is reflected in the geometrical compositions of Enlightenment artworks which focused on one unified scene. In a solar-centric worldview, the departure from theocracy to humanism and Cartesian individualism is echoed in the singular view of one-point perspective. Whilst perspective is a fifteenth-century invention – being extensively studied by Alberti in this time – it found its most mature, persistent and rational expression in Enlightenment philosophy, particularly through Descartes' conception of a mind-body duality. According to this view the mind is wholly different to, and thus exists apart from, the body and other 'substances out there'. On this basis, the Cartesian eye could be formulated as rational, objective and distanced, rather than as subjective, enmeshed and invested in what it observes. This Cartesian eye was the basis for the dominance of rationality in Enlightenment thought. From the mid seventeenth century Renee Descartes ushered in the beginning of modern visual culture through a strict emphasis on the single viewpoint of one-point perspective³⁷. The frescos in *Sant' Ignazio* in Rome, painted by Andrea Pozzo after 1685, are a remarkable expression of this central 'I'. The church has a *trompe l'oeil* barrel vault and 'dome' – the latter in effect a flat ceiling – each of which is only 'correctly' visible if one stands on its corresponding marker, set in the floor. The depicted scenes thus consist of individual components which coalesce into a 'rational', recognisable relation to each other if one occupies the specific vantage point of the Cartesian 'I'³⁸. Similarly, Calculus functions by deconstructing problems into smaller calculations to integrate these into one overall solution which ignores the complexities and distractions – friction in Calculus, multiple vantage points in *Sant' Ignazio* – which distort the final 'picture'.

³⁶ John Gribbin, 13 – 14.

³⁷ Christine Ross, "Vision and Insufficiency at the Turn of the Millennium: Rosemary Trockel's Distracted Eye," *October* Vol. 96 (Spring 2001): 90 – 95.

³⁸ Encyclopædia Britannic, "Sant' Ignazio," *Encyclopædia Britannica Online* <http://www.britannica.com/EBchecked/topic/523292/SantIgnazio> [accessed: 10 September 2009].



Andrea Pozzo. *Sant' Ignazio*.
After 1685. Rome, Italy³⁹.

The problem with a Newtonian worldview was that it did not allow for the observed complexity of the real world. Strictly speaking, Calculus was acceptable for predicting the interactions of two bodies, but not of any more components. Any modelling of the interactions between three or more components could only ever be an estimate, as these answers were arrived at by a series of calculations that considered only two bodies and extrapolated all these results into a final approximation. One can get close, with computers even very close, answers, but they are never exact, always containing some margin of error⁴⁰. This led to the development of Statistical Mathematics.

³⁹ Wikimages, "Sant' Ignazio," http://upload.wikimedia.org/wikipedia/commons/a/a6/Sant%27Ignazio_-_painted_dome_-_antmoose.jpg [accessed 8 December 2009].

⁴⁰ John Gribbin, 14 – 5.

Attempting to address the shortcomings of Calculus, Statistical Mathematics arose from closer observation of the biological and social world where cause and effect on the scale of individual interactions de-coupled and instead expressed themselves in statistics based on observations of whole systems⁴¹. Unlike Newton's idealised, stylised universe (where friction was discounted), Statistical Mathematics (also known as Probability Theory) considered real-world phenomena but abstracted them into a 'most likely' or probable scenario. Statistical Mathematics arose from attempts to analyse games of chance in the late sixteenth century and was formalised in the 1930s. It does not consider individual particles but looks at averages in systems. Now mathematics' ability to model and predict behaviours extended to the realm where the same input did not necessarily produce the same output, but where statistical averages applied⁴². The individual here is expressed in the macroscopic, just as in a statistical survey (or a democratic vote) the individual opinion forms part of an end conclusion, but has little significance on its own⁴³.

Le Corbusier's *Unité d'Habitation* is a good example of this thought concretised: the building expresses not the unique needs and aspirations of the individual resident, but rather the average, expected demands of the citizen as abstracted from a collective sample of humanity (at least as Le Corbusier understood it). Modernism's tendency to abstraction expressed a universalism which was about the traits of collective humanity (or, more correctly, of large sections within this humanity), rather than about the specifics of a particular biblical (for instance in Medieval art) or secular (as in Romantic art) narrative. The modernist trend to embrace manifestos and artistic movements similarly suggests a need to establish an average tendency within which to work, rather than to define the individual characteristic as of prime importance.

Let me briefly introduce Quantum Theory, which will be considered in more detail in relation to Eco's essay *The Poetics of the Open Work* in the next chapter. Quantum Theory is rooted in late nineteenth century experiments. It found mature expression in the late 1950s and early 1960s when electronics enabled computing. Quantum Theory introduced the notions of absolute uncertainty. Whilst all previous mathematical models suggested some sort of rationality and order in the universe, Quantum Theory suggested the radically unpredictable. Quantum Theory considers how the paths and behaviours of individual particles are not only unpredictable but depend on who is observing. In Quantum Theory, there are thus no predictable outcomes and any supposed outcomes can be contradicted depending on the approach taken by the observer. Quantum Theory focuses on the subatomic level⁴⁴. CERN, the rapid particle accelerator which allows scientists to work with individual protons, is the ultimate expression of Quantum Mechanics⁴⁵.

Chaos Theory developed from Quantum mathematics in the mid twentieth century. Chaos suggests the existence of order, though it is only ever evident in retrospect. Chaos works with complex, dynamic systems in which all matter and all energy is intricately interconnected. With Chaos, intricate real-world systems such as communication networks, weather systems and

⁴¹ Phillip Ball, *Critical Mass: How One Thing Leads to Another* (London: Arrow Books, 2004), 61, 65.

⁴² *Ibid.*, 53 – 66; 120 – 122.

⁴³ *Ibid.*, 58 – 61.

⁴⁴ Wikipedia, "Quantum Mechanics," http://en.Wikipedia.org/wiki/Quantum_Mechanics [accessed 12 February 2009]. Stephen Hawking, *A Brief History of Time* (London: Bantam Books, 1989), 58 – 60.

⁴⁵ Hugo Vaughan, personal communication, August 16, 2009.

social phenomena become analysable and interpretable in a far more realistic way, which can take into account abrupt disruptions and changes⁴⁶.

Before moving on, let me review the main characteristics and chronology of the mathematical models I mentioned above:

- Natural numbers formed the earliest mathematical system and were used, for instance, by the Ancient Egyptians and Babylonians. This system survived as the primary mathematical system until the medieval period. It is characterised by recounting the known in whole, finite elements.
- Newtonian Calculus was the mathematical framework of the Enlightenment period. It presupposed a rational relation between individual components, achieved by editing out complications and distractions.
- Statistical Mathematics gained maturity in the 1930s and looks at averages within systems.
- Beginning in the nineteenth century, Quantum Theory dominated the 1950s and 1960s. Quantum Theory looks at particles on a sub-atomic level and suggests absolute irrationality and lack of order.
- Chaos Theory is in many ways a development of Quantum Theory. It also had its beginnings in the mid nineteenth century, and was only formalised in the mid twentieth century. Key concepts of Chaos Theory are retrospectively observable order, abrupt disruptions and complete connection of all matter within a dynamic system.

Each mathematical development extends, but does not replace, the previous model. Think, for instance, of natural numbers: this earliest form of mathematics is still in daily use as we add, subtract and count basic units. In the same way my argument is not that ways of art production reflecting previous mathematical frameworks have ceased, but rather that the participatory mode of art production has recently been (re)emphasised in response to Chaos-based frameworks becoming part of mainstream cognition.

⁴⁶

John Gribbin, 70 – 103.

Chapter Two: Eco, Open Work and Quantum Theory

The previous chapter briefly mentioned some differences between Quantum and Chaos mathematical approaches. Let me now expand on the definition of Quantum Theory and the relationship Eco postulates between Quantum and the arts. I will use Eco's argument as a model for my own hypothesis that mathematical approaches affect social paradigms and thereby affect the art produced, and, by extension, that Chaos is such a current source of influence⁴⁷.

Quantum Theory was established mainly in the first half of the twentieth century and essentially looks at the structure, mechanics and interactions of the universe at the level of individual particles on an atomic or sub-atomic level, rather than within or between systems. In popular perception, aspects such as Quantum Entanglement, the conundrum of Schrödinger's Cat and wave-particle dualities are interlinked. What these all have in common is that they remove a sense of rationality and purpose from our understanding of matter and behaviour. Quantum Entanglement suggests that a sub-atomic particle can spin both to the right and to the left at the same time, and that its direction depends not on some natural law or reason, but rather stems from the expectations of the viewer. Schrödinger's theoretical cat is simultaneously alive and dead, and wave-particle dualities state that electrons behave as both waves and particles at the same time. In short, Quantum Theory removed the supremacy of rationality and predictability and introduced the idea of decoherence, with the viewer influencing or forming what he or she observes⁴⁸.

Since the early 1960s, a host of popular scientific literature has tried to make Quantum Theory (and especially its sexier aspects such as the experiments and principles mentioned above) understandable to the layperson. Whilst few members of the general populace actually do understand Quantum Theory, the *ways of thinking* which Quantum Theory allows for have been popularised and have shifted our approach to all aspects of life, including the arts.

While aspects of Quantum Theory became widely known in the 1960s, it also gained attention in more philosophical forums. I will briefly mention two examples: Umberto Eco's reference to the

⁴⁷ One could also compare Chaos Theory to natural numbers, Newtonian and Statistical mathematics. The absolute determinism of geometry, with distinct causes and effects for all phenomena, stands in stark contrast with the world of Chaos Mathematics, where an outcome is not determinable based on starting position. In a natural number understanding the end result was the sum of its part, determinable in advance. In a Newtonian universe it was still feasible to consider isolated matter, interpreted to exist in a context-less, idealised binary system with no influence from other material or forces. Newtonian mathematical modelling was based on a paradigm of stability, where 'inconveniences' such as friction to all intents and purposes could be ignored, and where complexities could be smoothed out to reveal a universe as seen from the observers' standpoint. Here, the Cartesian 'I' spoke of the individual, all-powerful being, isolated and disembodied in his (sic.) analysis of the universe. Such an isolation and individualism is problematised in the world of Chaos as this theory has highlighted the holistic interdependencies of all matter and forces.

Amelia Jones. *Body Art: Performing the Subject* (Minnesota: University of Minnesota Press, 1998), 10.

The averaging of Statistical Mathematics sees matter as part of a probable and simplified system, as opposed to the dynamic systems Chaos considers.

⁴⁸ Jeffrey But, "Quantum Entanglement," in *Stanford Encyclopedia of Philosophy*, ed. Edward N Zalta, <http://plato.stanford.edu/archives/sum2009/entries/qt-entangle/33>. Summer 2009 [12 July 2008].

concept and the link I perceive to Barthes' notion of the 'birth of the reader'⁴⁹. Whereas Eco expressly identifies a link to Quantum Theory, I am not aware of Barthes ever having done so. This does not, however, discount my point, as Barthes would still have worked within a social milieu, a social framework informed and infused by ways of thinking resulting from Quantum ways of thinking.

Let us first look at Eco's link between Quantum Theory and the art of his day as analysed in his essay *The Poetics of the Open Work* (1962)⁵⁰. Eco describes the musical composition *Klavierstück XI* (1956) by Karlheinz Stockhausen as having no fixity, being re-interpreted and re-invented with each performance. The composition consists of a large sheet of paper with numerous groupings of notes, which the performer can choose to play in any order. Other composers working in a similar vein whom Eco mentions are Luciano Berio, Henri Pousseur and Pierre Boulez. Eco accepts this contingency as an expression of the uncertainty and lack of rationality of Quantum Theory. Instead of a pre-determined symbolism of musical notation, where the composer's will leaves little room for interpretation, Stockhausen prods the musician into action and leaves most other musical decisions open to choice. The confusion and uncertainty of a Quantum universe defines this music. According to Eco, Quantum Theory created a generalised sense of disarray within cultural products and debates. He pointed to Quantum Theory as mirroring life's complexity, in contrast to modernism's reductionism, and argues for this understanding being reflected in the arts⁵¹.

The second example of Quantum principles observed in philosophical thought I want to postulate is Barthes' contention of the 'birth of the reader'. This notion placed the contingency of meaning not only in the court of the author/performing musician (to carry on with the musical theme), but also in that of the reader/listener, as each respondent to an artwork – or indeed to any cultural product – views and interprets the product through his or her particular lens. To word it in terms of Quantum Theory, the expectations of the 'reader' fundamentally change what is observed (I am referring to the Quantum Entanglement and wave-particle duality proposals discussed earlier).

If, as I showed above, Eco allowed postmodern art to be read in terms of Quantum thinking, then I would like to extend his project by reading current art in terms of Chaos.

⁴⁹ Roland Barthes. *Image – Music – Text*, trans., Stephen Heath (New York: Hill and Wang, 1977).

⁵⁰ Umberto Eco in Bishop. *Participation*, 20-40.

⁵¹ *Ibid.*

Chapter Three: Learning to Think in Terms of Chaos

Having explained the link between Quantum Theory and open work which Eco drew, I will continue to argue that, in a similar manner, Chaos Theory can be seen as the framework which encourages participatory art. To do so, I will first introduce some main principles of Chaos Theory. Before considering how Chaos can be seen as a framework for current participatory art, let me explain three characteristics of Chaos – interconnectedness, feedback and phase change.

The concept of Chaos Theory often seems an esoteric mystery. For our purposes, however, a basic understanding of three important Chaos characteristics will suffice. This does not involve any difficult mathematical concepts and each Chaos characteristic mentioned can be explained in a few succinct paragraphs. Each of the three prime Chaos qualities will be described and illustrated with reference to one real-world example. In the next chapter I will expand on this by relating the three motifs to particular art projects. In doing this, I attempt to show that these three prime characteristics of Chaos have become part of our everyday way of framing the world and our place in it and, by extension, the adoption of Chaos thought into common daily understanding and actions is paralleled by the expression of these Chaos characteristics in the arts.

Interconnectedness is this essay's first major characteristic of Chaos Theory. Chaos Theory was developed to analyse complex, dynamically evolving systems, as opposed to the single-element systems of Quantum mechanics. As such, Chaos Theory deals with totalities, not with individuals, which implies a connectedness. Through the lens of Chaos it is impossible to abstract systems into individual parts, or statistically to average out matter into probable scenarios, as each individual component (at the smallest level of the subatomic) interacts with the rest of the system in a way that fundamentally alters it. Deducting one quark or one joule of energy from any system has the potential to alter completely how this system develops in comparison to how it would have developed without this deduction⁵².

A daily manifestation of the interconnectedness of Chaos Theory is the small-world network – or six degrees of separation between people – where there is no person in the world who is not a friend, of a friend, of a friend, of a friend, of a friend⁵³. LinkedIn, a career-building site, and the social networking site Facebook, bear this out. In 2009 Facebook has more than 250 million members⁵⁴, but even people who are not signed up are represented: as members search for

⁵² John Gribbin, 70 – 103.

⁵³ Michael Blastland, "Connecting with People in Six Degrees," BBC News (13 July 2006) http://news.bbc.co.uk/2/hi/programmes/more_or_less/5176698.stm [accessed 10 August 2009].

⁵⁴ More than 120 million users log on to the Facebook site at least once a day. Facebook, "Press Room Statistics," <http://www.facebook.com/press/info.php?statistics> [accessed 18 August 2009].

names of people they know and would like to follow on this website, so a presence, or profile, of these searched-for people gets built. Crucially this profile exists and develops regardless of whether an individual ever visited the Facebook site. If you visit Facebook for the first time, you may find a host of messages and invitations waiting for you in cyberspace. Facebook hereby becomes a symbol for an inescapable interconnectedness.

Phase change and, aligned with that, tipping points is the second Chaos Theory characteristic this essay will discuss. I will use two examples to illustrate the occurrence of phase change in our lived reality: instant freezing of supercooled liquids and ice formation. Instead of a linear progression, a complex Chaos system is marked by abrupt changes, stops and starts; these sudden adjustments are referred to as phase changes. The initiation of a phase-change occurs at a critical or tipping point. Before this point, there is no phase-change. When this point is reached, phase-change propagates rapidly. This is unlike linear mathematics. The mere existence of a tipping point is an illustration of Chaos Theory⁵⁵. I will explain why this occurs later, but one way to illustrate phase change is to place a bottle of Perrier water into a freezer for some time, then to open it and pour it into a glass. There are approximately two seconds between the opening of the bottle and the freezing of the water, so that once poured, it becomes solid ice in the glass. Perrier is so pure that it can be supercooled and remain in liquid form until a tipping point is reached. Here, the change of pressure brought about by the removal of the cap from the bottle is such a point⁵⁶. Abrupt changes such as these wreak havoc with the averaging of Statistical Mathematics.

D:\Ice.mp4

To access Mp4 video showing the supercooling of water, Ctrl+Click on the link with the CD in the D-drive. Alternatively, view directly from CD⁵⁷.

Let us look at the formation of ice to reiterate this: water 'jumps' from a liquid to a solid state, without any intermediate phases of increased viscosity. There is no smooth and predictable continuum; instead there are sudden, often massive, shifts, the reasons for which are so complex and sensitive that they cannot be pre-determined. To all intents and purposes, what happens is that a group of water molecules in the liquid suddenly decides to become solid. But which molecules do so, when and why they solidify, is due to some unobservable micro-influence. It is not analysable ahead of time why a collection of individuals suddenly work in concert to display vastly differing behaviour from the previous state or the behaviours around them.

Phase changes are the result of unequal feedback into a system, as opposed to a linear iteration, such as would be assumed under Newtonian and Statistical laws⁵⁸. This feedback is

⁵⁵ Phillip Ball, 100 – 102.

⁵⁶ Phillip Ball, 201 – 202. Joe Wolfe, "What is 'Unfreezable Water? Is it the same as bond water or water hydration?" 2005, Sydney: University New South Wales School of Physics <http://www.phys.unsw.edu.au/~jw/unfreezable.html#hydration> [accessed September 3 2009]. Susan Gaids, "Supercool and Strange: Scientists are finding clues about why water is so utterly weird", in *Science News Online*, 26 January 2008. <http://sciencenews.org/articles/20080126.bob9.asp> [accessed September 3 2009].

An alternative example would be the heating of water in a non-rotating microwave. The water appears not to boil in the appliance, but the application of the slightest tipping point to the superheated microwaved liquid (such as the agitation of opening the microwave door) will lead to the liquid exploding.

Joe Wolfe, "Superheating and Microwave Ovens", 2005, University New South Wales School of Physics: Sydney, <http://www.phys.unsw.edu.au/~jw/superheating.html>. [accessed 3 September 2009].

⁵⁷ _____, "Surfusion de l'eau" <http://www.youtube.com/watch?v=rzmDJTGHaj8&feature=related> [accessed 14 July 2009].

the final characteristic of Chaos I want to discuss, using an example from evolution to show how feedback is expressed in daily life.

Feedback states that a system can never return to its original condition as each system depends for its character on the environment in which it functions, but, at the same time, unavoidably changes this environment. What a system does affects its own context and hence the system's own behaviour. This altered behaviour in turn influences the system's context, so the system 'feeds back' into itself. Iterations in natural arithmetic rely on linearity and predictability, such as the algorithm for compound interest, whilst Chaos Theory recognises that in complex systems, amplifications and repetitions occur in a non-predictable manner due to acute sensitivities to feedback pressures which can lead to phase changes⁵⁸.

A relatively well-known example of feedback is the Darwinian case of the Peppered Moth. Researchers showed that over a period of industrialisation this moth species' colouring became darker as soot darkened its environment. The reason for the change was not the moth's reaction to a darkening environment, but rather the vulnerability of lighter moths to being seen and eaten by birds. The likelihood of surviving was thus directly in the relation to the ability to blend into the surroundings. Better 'blenders' were more likely to survive for long enough to reproduce and thus, unlike their lighter cousins, were more likely to feed their genes back into the gene pool. This dominance of darker genes naturally increases with every subsequent generational cycle as in each cycle more dark than light moths escaped being eaten, but each cycle also had a larger 'dark' gene pool to replicate⁶⁰.



Peppered Moths⁶¹

⁵⁸ John Gribbin, 124 – 125.

⁵⁹ *Ibid.*, 3.

⁶⁰ Michael E.N. Majerus, "Industrial Melanism in the Peppered Moth. Biston Betularia: An excellent teaching example of Darwinian evolution in action," Springer Science and Business Media (6 December 2008) <http://www.springerlink.com/content/h7n4r6ho26q1u6hk/fulltext.html>, [accessed 27 August 2009].

⁶¹ Wikilimages, "Peppered Moths," http://i.dailymail.co.uk/i/pix/2009/06/19/article-1194281-0569A8EC000005DC-1_468x314_popup.jpg [accessed 8 December 2009].

To review, Chaos Theory embodies inescapable interconnection where each part of a system, no matter how small in magnitude, has the potential to affect a system. Each system has to be considered as a dynamic whole of endless interconnections. As these systems are interconnected within themselves and with their context, they operate through feedback as the different elements of a system and its environment feed back into the system's behaviour. This is not a linear feedback, but, due to the acute sensitivity of systems, occurs with abrupt phase changes⁶².

Before I move on in my argument, let me briefly mention stochastic behaviour, which is a result of the three characteristics mentioned above and which helps clarify the difference between Quantum indeterminacy and Chaos order.

Chaos Theory speaks about stochastic behaviour among sets of elements connected into a system. Stochastic means that order exists, but it is only retrospectively observable: looking back one discerns a pattern, but there is little predictability on future events. The reason for this is that as a system iterates, it interacts with its environment and itself in a series of feedback loops and incorporates phase changes which are so sensitive and complex as to be unpredictable ahead of their occurrence. As much as it seems like a contradiction, Chaos is thus about order, not about disorder. The name Chaos Theory is rather unfortunate, as it suggests randomness and turmoil, according to general use of the term in the English language. Instead of disarray in this sense, however, the chaos of Chaos Theory is always ordered; except that it is practically impossible to foresee what is going to happen and what pattern exists as quickly as events unfold in real time. Order is only discernable retrospectively. This is where Chaos is fundamentally different from Quantum Theory. The Chaos universe is ordered, but such order cannot be discerned ahead of an events' occurrence⁶³. Quantum Theory suggests absolute irrationality and unpredictability.

⁶² John Gribbin, 70- 103

⁶³ *Ibid.*, 70, 75.

Chapter Four: Observing Chaos Characteristics in Participatory Art

If, as discussed in the previous chapter, Quantum Theory through its irrationality and unpredictability characterised the nihilism and existential questioning of postmodernism, then Chaos suggests a shift to the post-postmodern. Here, at least on a subliminal level, it is the lessons of Chaos which have permeated social memes. I will now sketch this out by discussing each of the three characteristics of Chaos I identified earlier - interconnectedness, phase change and feedback – in relation to an art project, starting with the idea of interconnectedness.

Before linking interconnectedness to an art project, I want to clarify my use of this term further. I want to make clear that I understand the term 'interconnectedness' in a specific way, and that this is quite different to a general sense of connection. Innumerable movements, groupings and manifestos in history suggest that belonging and connectedness is a human and social imperative. Recently, however, a shift has happened from what I would call 'connectedness' to 'interconnectedness'. Connectedness speaks about a grouping of people in order to achieve a particular goal or champion a particular belief system. This connectedness mostly relies on at least some sort of structure and agreement about, the sense of the organisation. Interconnectedness, as I use it, is an understanding of inevitable and holistic connectivity beyond specific messages or causes. Allow me a general (and generalising) statement contrasting a modernist, postmodernist and post-postmodern view of connection. I do so to highlight the importance of interconnectivity in the current milieu. The grand-scale utopian drive to change the world was a strong trend in modernism. Post-modernism emphasised that all is subsumed in and constructed by a hegemonic system, but the power dynamics within this render the individual a disaffected, disconnected entity, constantly striving to invent and perform him or herself⁶⁴. The post-postmodern world of Chaos, in contrast, is about incessant and inescapable connectivity, where the individual is not nihilistically subsumed by systems, but changes systems on a micro-level through feedback-interaction. In this relational world all is connected and has a source and a history.

Having clarified my use of the term, let me now consider interconnectedness in relation to participatory art projects. Let us look at how the Woodstock Market is an artistic expression of such interconnectedness. The Woodstock Market at the Old Biscuit Mill, Cape Town, suggests the networked enmeshment which I sum up in the term 'interconnected'. Essentially a Saturday neighbourhood market, The Woodstock Market was set up as an art project by gallery owner Justin Rhodes. The market has become a hugely popular attraction in Cape Town; interestingly most people attending are not aware of its original status as an artwork. The products sold at the market mostly fall in the category of 'organic' and are sold by the actual producer. Here it is not enough to buy ones' olive oil, but one needs to express enmeshment with the world through an emphasis on environmental consciousness. Knowing the farmer who grew and pressed the olives similarly is about the six degrees of separation network: it suggests a personal involvement and belonging, which a mass-produced supermarket product rarely has⁶⁵. Rhodes stresses that the market is meant to be a meeting place. He recounts the numerous times he

⁶⁴ Ulrich Beck, 269.

⁶⁵ Though with advertisements and by-lines such as 'Engaged, Motivated, Involved' (Standard Bank SA) and 'We're on your side' (Pick 'n Pay Supermarket) it is clear that supermarkets and other commercial ventures increasingly attempt to project an image of belonging.

has seen old friends have per chance meetings and reconnect whilst browsing amongst the market stalls. The market thus expressed a holistic belonging to the network of the environmental, the wider social and the intimate⁶⁶.

The second characteristic I considered - phase change initiated by tipping points - is also echoed in participatory art, where flash mobs illustrate phase changes. These mobs show how a complex system is marked by abrupt changes, stops and starts. Flash mobs, the first of which happened in 2003, gather suddenly in public spaces, perform some collective action and disperse again. Bred through social networking sites, telecommunications, word of mouth and emails, there is not necessarily a leader, organiser or determinant of meaning to these events. The original idea for a 'flash' might start with one person, but the growth is exponential and far beyond this originator's control. Certainly, of the people gathering in the flash mob few, if any, will know who first conceptualised the meeting. These events thus rely on engaged, communal interaction. There are seldom 'scripts' and assigned roles and the purposes and actions of the mobs are flexible and open to interpretation. An example of this would be the 2006 *Silent Disco* mob held simultaneously on London underground platforms. During this event some 4 000 people met in the Victoria station alone, at a set time switched on their portable music players and danced to their music⁶⁷. The value of this flash is open to each individual participant and witness's interpretation: be it political commentary, anarchic disruption, entertainment, art, etcetera. Whilst flashes are often art projects, such as the flashes planned by Emergency Room and Biennialist for the 2009 Venice Biennale, even the interpretation of them as such is not necessarily shared by all the participants⁶⁸.

A flash mob is an ordered system in a space with no instructions apparently given, creating a phase change in a movement of people. There is an external triggering point, but it is at a different time. Witnesses to these events see a drastic shift from one form of crowd behaviour to another so that flash mobs thus create an impression of phase change.

D:\flash mob.mp4

To access Mp4 video showing the supercooling of water, Ctrl+Click on the link with the CD in the D-drive. Alternatively, view directly from CD⁶⁹.

Francis Alÿs's *Looking Up* (2001) must be one of the simplest phase change artworks, though admittedly the participants are unaware of the art project. Alÿs simply stood in a Mexico City square and concentratedly looked up at the sky. People started congregating around him and, similarly, gazed upwards. After a while Alÿs walked away. The series of photographs which

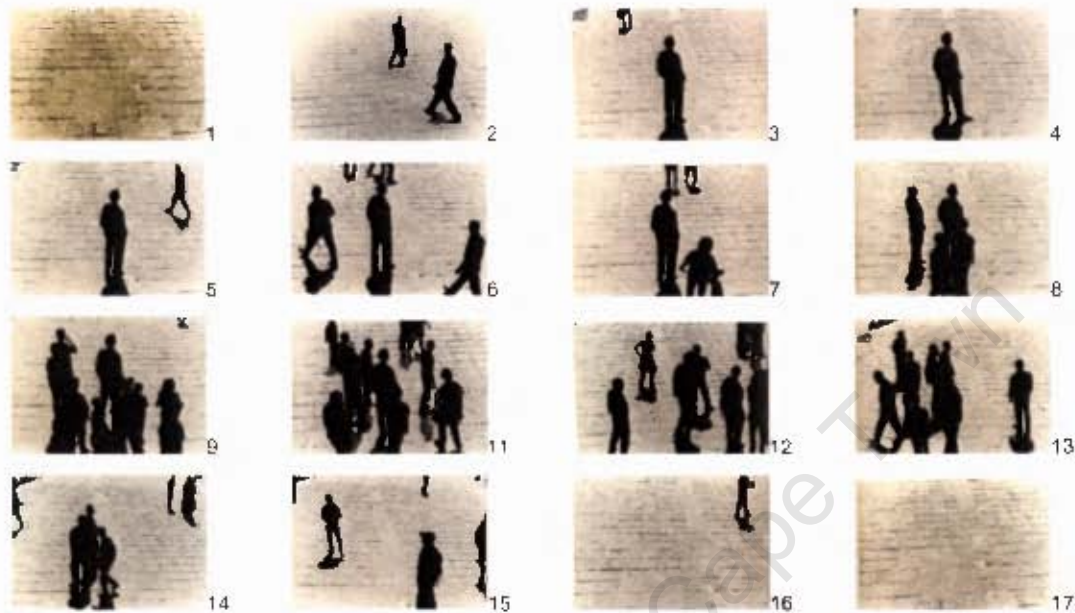
⁶⁶ Justin Rhodes. Personal communication. 23 August 2009.

⁶⁷ Judith A. Nicholson, "Flash! Mobs in the Age of Mobile Connectivity," *Fibreculture* Iss.6 http://Journal.fibreculture.org/issue_6nicholson.html [accessed 14 July 2009]. Wikipedia, "Smart Mob," Wikipedia, http://en.wikipedia.org/wiki/Smart_mob [accessed 10 April 2009].

⁶⁸ Emergency Room and the affiliated Biennialist are projects organised by Danish guerrilla artist Thierry Geoffroy (aka Colonel), mostly focusing on large-scale art events. In this case, they organised flash mobs in collaboration with artist Daniel Medina and curator María Luz Cárdenos for the Venezuelan Pavilion, artist Jassi Kivi for the Finnish Pavilion and artist Jacque Charlier and curator Enrico Lunghi for the Belgian Boat. Biennialist, "There is no Good Biennale without Biennialist", <http://www.emergencyrooms.org/biennialistnews.html> [August 17, 2009].

⁶⁹ _____, "Birmingham Silent Rave Flash Mob" <http://www.youtube.com/watch?v=3s3IL9TjR9k> [accessed 14 July 2009].

record this event shows the seemingly random clumping of a group of people, and the subsequent dissolution of this small crowd⁷⁰.



Francis Alÿs. *Looking Up*, 2001. Video documentation of an action 4 min, Mexico City⁷¹.

The previously discussed examples, Woodstock Market, *Looking Up* and flash mobs, could not exist without feedback, the next aspect of Chaos I want to relate to participatory art. The main components of feedback are, firstly, a system and secondly agents or environments which form part of the system, but also change this system and are changed by it. Chaos understands any system as constituted by smaller separate entities which cannot be isolated from this system. Let us look at Ed Young's one-night exhibition *Asshole* (2004) as an example of such feedback. For this exhibition, Young sent out an open invitation to the Bell Roberts Gallery. Here, in a party atmosphere, topless strippers served Kentucky Fried Chicken; beer in ice-filled tin tubs and cigarettes (for VIP guests) were freely available⁷². The art project was not the material matter, nor the strippers, but the totality of these, the interactions, the presence of the audience and the event as a whole. Each visitor/participant both constituted and influenced the artwork. Participants chose how to interact with what they saw around them (and were part of): whether engagement, bemused observation, or even a pinch on the bottom from one of the busty strippers. All these individual responses combined to form the artwork. Each action thus constituted a part of the system/ artwork, but also altered the system/ artwork. This suggests that there is a randomness and unpredictability to the work, but that this is the randomness of a group; just as the storm is made up of multiple individual droplets of rain, and yet is more than the totality of its droplets.

⁷⁰ Cuauhtémoc Medina, Russell Ferguson & Jean Fisher, *Francis Alÿs* (London: Phaidon Press Ltd, 2007), 95.

⁷¹ *Ibid.*, 93-94.

⁷² Andrew Lamprecht "Flash, aha" *Art Southafrica* Vol.2, Iss. 3. (Autumn 2004): 48-53.

To further clarify this, let us contrast *Asshole* with the performance *Imponderabilia* (1977) by the Netherlands based Marina Abramović and Ulay. For *Imponderabilia* the naked artists stood either side of the entrance to the Galleria Comunale d'Arte Moderna in Bologna, Italy, so that the public unavoidably had to squeeze between them to gain entry to the exhibition space. In the words of the artists: "We are standing naked in the main entrance of the museum, facing each other. The public entering the museum has to pass sideways through the small space between us. Each person passing has to choose which one of us to face"⁷³.

Comparing *Asshole* to *Imponderabilia* we observe that in both projects nudity, normativity and divisions between public and private are problematised. Unlike Young's work, in *Imponderabilia* each audience member interacts in a discreet, contained manner. Participation does not necessarily influence or alter the artwork or other peoples' engagement with it. Each person's entry into the museum is a discreet entity, reflecting Quantum Theory's concern with the single. *Asshole*, in contrast, is about the totality of a holistic, dynamic Chaotic system.

If there were no participants, *Imponderabilia* would still function as a conceptual art piece: one can consider how one would respond to the work on an abstract, theoretical level. In contrast, one cannot imagine one's engagement with Young's work, simply because *Asshole* is not an individual's response, but is an enmeshed system where your presence (or lack of such) fundamentally alters the artwork. If you were present at Young's exhibition, your very attendance (and your interpolated choices) would feed-back into the event, conclusively changing the work from what it would have been without your presence. As an aside: whilst this is not true of all artworks from the 1960s and 1970s, one can nevertheless generalise that participatory ('open') art from this period tended to be about individual engagement within a group, whereas contemporary participatory art expresses a lack of boundaries between the self and others.

I have observed how participatory art expresses the three primary characteristics of Chaos I previously identified. Section 2 will look at further examples of these Chaos characteristics – interconnection, feedback and phase change – as expressed in participatory art and wider social phenomena. Before doing so, however, I want as an aside to mention expressions of some Chaos characteristics other than interconnection, feedback and phase change in participatory art. The expressions I consider here are dynamic systems and sensitivity to starting conditions.

Let us begin this digression by considering participatory art as an example of dynamic systems. As previously discussed, Chaos Theory was developed to analyse complex, dynamically evolving systems, as opposed to the single-element systems of Quantum Mechanics. As such, Chaos deals with systems, not with individuals. To put it symbolically: in Chaos the ecosystem matters, not the plant. The plant is of course part of the ecosystem and the ecosystem cannot exist without the plant, but the ecosystem is more than the sum total of all the plants. In a similar manner, the Chaos artwork depends on the physical and the physical is *in* the artwork, but the artwork is *not* the physical. When the artwork is removed, the physical remains, but is not art anymore. In Young's *Asshole* there were numerous 'props' which were integral parts of this art project (the chicken, take-away containers, the beer, tables, etcetera). None of these objects on their own, however, are an artwork, nor were these physical elements as a totality an artwork without the interaction of the audiences with and around them.

Let us now consider how a further characteristic of Chaos Theory, namely, that systems are particularly receptive to starting conditions, is observable in participatory art. A principle of Chaos Theory is that a miniscule change at the birth of a system will have major and far-reaching implications later in its life. This phenomenon has become popularly known as the 'butterfly effect'. A main reason for such sensitivity to starting positions is the ubiquity and importance of iteration with feedback in a Chaos universe⁷⁴.

Edward Lorenz, in various articles and talks presented in the early 1960s and the 1970s, used Chaos Theory to illustrate the acute sensitivity of systems to initial pressures. In 1961, Lorenz investigated weather phenomena. When inputting data into a computer, he took a shortcut by changing the decimal value from .506127 to .506. The result was a completely different weather prediction. This showed that a small differentiation could have major implications due to its amplification through feedback. When Lorenz first presented his findings, a fellow meteorologist remarked that, if the theory were correct, "one flap of a seagull's wings could change the course of weather forever"⁷⁵.

This image of a faintest action in one part of the world having huge ramifications grabbed the popular imagination and led to a large-scale consciousness of the possibility of radical change through small pressures. Lorenz wrote and lectured particularly about starting conditions of systems, but in the popular press and imagination this has been broadened to a potential sensitivity during the complete life-cycle of a system to any stimuli, regardless of magnitude. The catchy title which Phillip Merilees attached to one of Lorenz's presentations, *Does the Flap of a Butterfly's Wings in Brazil set off a Tornado in Texas?* turned out to be a brilliant slogan for this oversimplified understanding of Lorenz's work, helping to popularise this idea⁷⁶. In the popular imagination, then, the butterfly effect suggests that a seemingly small contribution to a system has the potential to alter the system beyond recognition - indeed even the lowest status individual can theoretically alter all⁷⁷.

Looking at participatory art, one frequently sees a similar microtopian optimism about the small-scale action and its impact on local systems. John Rubin's *FREEmobile* (2003) addresses the specific neighbourhood of Hillman City, Seattle. The *FREEmobile* is a Chevrolet van painted in bright colours with the word "free" emblazoned on its sides. Each weekend of the summer of 2003, a different family drove this van through Hillman City, giving away handmade goods or services to their neighbours. In the act of handing out hand-printed T-shirts, crocheted objects, bike repair services and so on, residents got to know each other and celebrated folk culture. They also stepped outside of the normal trading rules of the commercial sphere⁷⁸. This project functions in a very specific space, and on the personal. Like the butterfly's wing, however, it suggests the possibility of a shift in phases occurring from such a seemingly insignificant interaction.

⁷⁴ John Gribbin, 55 – 57.

⁷⁵ The acuteness of this sensitivity is shown by the Chaos understanding that it is impossible to repeat an experiment and get the same end result. The action of performing an experiment unavoidably diminishes or changes the energy balance in the universe (even if at a miniscule level of the subatomic), so that the second experiment is performed in an altered context which could, through feedback, lead to a different end result.

⁷⁶ Gribbin, 55-57. Wikipedia, "Butterfly Effect," http://en.wikipedia.org/wiki/Butterfly_effect [accessed 23 July 2009]. The title suggests that the flap of a butterfly's wing could lead to massive climatic changes in another part of the world.

⁷⁷ *Ibid.*

⁷⁸ Rudolf Frieling, 139.



John Rubin, *FREEmobile*, 2003.
Installation view in Seattle⁷⁹.

To conclude, let us clarify this point by looking at how Newtonian and Statistical Mathematical models understand the impact of small-scale actions. In Newtonian understanding, every action has an equal and opposite reaction. In this view, input equals output on a material level, but, by extension, also on a social level. Echoing this is the modernist emphasis on large-scale social organisation as prerequisite for change. Whether the spectacle of Nuremberg or the rhetoric of Communism, the message was that a large number of people exercising a considerable collective force would lead to a desired political or ideological shift. Individuals shaped their identity (both as people and artistically) around this belief that collective action (a key word of modernism) would lead to a shift towards a greater utopia. This utopianism was understood as universal and the rallying cry was seen as a dismantling of overarching meta-narratives.

On a superficial level, it seems that the interactive mode of current art production, which draws on wide audiences (both in numbers and backgrounds), echoes such collectivism. There is, however, a fundamental difference in that the meanings and interactions of these works are predominantly focused on and determined by small-scale interactions. The notion of the grand overarching cause, the big rally and the fight against meta-narratives, is here replaced with a stress on the immediate, local and interpersonal (rather than the future-driven, global and collective or crowd-based). A political example of this idea is, for instance, the green movement, where stress is frequently placed on the possibility of a seemingly minor intervention or change in individuals' habits leading to a possible "saving of the earth", i.e. leading to what is probably the most urgent imperative to ever face humans. This small-world approach contrasts with the grand narratives of modernist political rhetoric⁸⁰.

To summarise this again in terms of mathematical frameworks:

- In Newtonian world-views, disturbances are dealt with by simply editing them out. In comparison, in Statistical Mathematics upsets and unusual actions are evened out to conform to the average behaviour.
- In line with statistics, actions which fall outside the average become insignificant and are either smoothed out by dominant trends in behaviour, or are dismissed as atypical and thus of no importance to the sample at hand.
- Both the Newtonian and Statistical models place the emphasis on the main trend, and both weight the importance and effectiveness of the average or normative.

⁷⁹ *Ibid.*, 139

⁸⁰ See: Nicolas Bourriaud, *Relational Aesthetics*, 28, 36, 46. Okwui Enwezor, 79 – 95. There are, of course, exceptions to this search for the grand-scale in modernism: think, for instance, of William Morris.

The phase-change nature of Chaos Theory, in contrast, shows that a smoothing or averaging out of behaviours does not give an accurate picture. As we saw in the example of water freezing, in the averaged-out understanding of Statistical Mathematics, water would start as a liquid and, in a continuum, would gradually become more viscous until it reaches a solid state. As we know, what actually happens is that a miniscule shift in conditions (temperature or pressure, for instance) leads to a phase change which makes the liquid water (almost) instantaneously shift to a solid. This could be seen as a model for the phase-changes the 'miniscule' influence of the individual can initiate. In other words, the science of Chaos has shown that each action has the possibility of not an equal and opposite reaction as Newtonian laws state, but of a result far greater in magnitude than the original action. The obvious corollary to this is that intervening agents that are large in magnitude (and here one could think of crowds, for instance) cannot necessarily be relied upon to exercise a shift in a system which is directly related in magnitude.

In numerous projects staging what Kathryn Smith calls "her idiosyncratic microtopia", artist Bridget Baker engages audience members in a positive, communal and 'therapeutic' mode, suggesting the possibility of a more holistic and meaningful way of being through small-scale interventions⁸¹. When Baker uses the slogan "Only you can" in various projects, she becomes an admittedly somewhat desperate cheerleader to the individual's efforts, suggesting promise and possibility in the 'small' actions of individuals. This phrase echoes the glib advice familiar from pop-psychology books and Oprah-esque television programmes, but the slogan also highlights the choices people have which, according to Baker, "uplift people to feel a little freer in their lives". For the *Official BB Mittens Project* (2005) at Liste, Switzerland, members of the public were invited to insert their hand into a hole in a partition. Baker, sitting behind this partition, gave them a paraffin wax hand-treatment. When she was finished, she covered participants' hands with knitted mitts which they could keep. To quote Smith again: "interpersonal interaction and collaborations are central. Public space has become a site for action"⁸². Here, the small-scale personal interaction in each person's life is seen as the "site for action", that is, is seen as potentially transformative.

⁸¹ Kim Gurney, "Artbio: Bridget Baker," *Artthrob*, www.artthrob.co.za/06Mar/artbio.html [accessed 10 February 2009].

⁸² *Ibid.*

James Meyer discusses Felix Gmelin's video work *Colour Test: The Red Flag II* as an illustration of the shift from optimistic utopianism to the qualified microtopian. This project consists of two side-by-side video projections, one showing *The Red Flag*, a video produced by Gmelin's artist father in 1968. Here a series of runners in relay run with a red flag through the streets of Berlin, before the last runner triumphantly waves the flag from the balcony of the city hall. The second projection shows Gmelin's restaging of this event in Stockholm, 2002. Not only have the fashions moved on – clothes, hairstyles, cars – but the attitude of the runners has changed too. The boundless optimism and revolutionary fervour of *The Red Flag* is replaced with lethargy.

James Meyer, 324 – 326.

Section 2

“What would it look like
And would you want to see
If seeing meant you would have to believe”⁸³

The first section of this dissertation introduced the hypothesis that an approach to the world through a Chaos-based framework is observable in participatory art. This is a complex argument and for this reason this section simply lists further examples of social life and participatory art mirroring each other as parallel expressions of Chaos characteristics. Through these added examples, I hope to give further credence to the argument in Section 1.

To restate the central premise: if wider social phenomena are parallel manifestations of a Chaos-based approach to the world, participatory art is another such manifestation. I intend showing this by indicating similarities between characteristics of wider contemporary social phenomena and characteristics of participatory arts. The affinity in operation and expression between these suggests that they answer the same social or audience demands. This is not a matter of a linear influence of cause and effect. It is not that Chaos inspires certain characteristics which are then expressed in various social phenomena. Rather, encountering Chaos characteristics in daily life raises expectations that these characteristics will be encountered elsewhere. We are thus not speaking of a causative relation between Chaos Theory and social phenomena, rather, there is a complex pattern of escalation which encourages interaction, feedback and phase change in a dynamic, chiasmic system which itself can best be analysed as another Chaos phenomenon.

I stated earlier that I will look at wider social phenomena. Given the scope of this dissertation only three examples will be used: internet-based information; social networking; and experience economy⁸⁴.

Even within these examples, the intention is not to be comprehensive, but rather to sketch out a few pertinent developments to illustrate my hypothesis. Let me list in more detail what aspects of the three phenomena – internet based information, social networking and the experience economy – I will consider.

Focusing on the internet as an expression of a Chaos framework is appropriate, as it is through computer networks that contemporary digital society functions. These networks overtly realise

⁸³ Lyrics 007, “Joan Osborne – One of Us”
<http://www.lyrics007.com/Joan%Osborne%Lyrics/One%of%Us%Lyrics.html> [11 September 2009].

⁸⁴ Participatory arts and these wider social phenomena can be described as resulting out of a Chaos paradigm. Without Chaos Theory the Internet could not have been created. Similarly, the global post-industrial economy, including the experience economy, depends on the Internet and the ability to understand complex social and economic systems through Chaos mathematics.

the feedback and interconnectivity of Chaos⁸⁵. Chapter 5 cites the examples of information access and creation. I conclude this chapter by considering personalisation and fragmentation as prominent characteristics of the current milieu.

The following chapter considers social networking sites as illustrations of a simultaneous 'radical interconnectivity' and an obsessive self-assertion. Lastly, I briefly reflect on lives in an experience-driven economy as marked by discontinuity and change.

The above social phenomena are described with the intention of showing how Chaotic interaction, feedback and phase changes are observable in these social phenomena. Comparisons with participatory art projects illustrate parallels between these wider social phenomena and the art under consideration and, by extension, suggest a similar assumption of a Chaotic framework.

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⁸⁵ Logically, Internet based art relies on web interaction and feedback; I am more interested, however, in art which seemingly works outside the digital and at times even appears to be a reaction against this new technology.

Chapter 5: Interconnection, Feedback and Information

The canon, classification and organisation of knowledge that allows a culture to identify itself with and pass down a collective memory, has a much broader social function than that of simply transmitting knowledge; it defines the threshold of identity below which a culture ceases to recognise itself. As such it is maintained not as a cultural artefact for transmitting knowledge from one generation to another, but as a society's "sacred archive", constituting responses to the question: "Who are we?"⁸⁶

Every large-scale change in technology causes a redefinition of knowledge and how it is controlled⁸⁷. In this way, the development of contemporary new media has led to substantial transformation in definitions, approaches and access to information⁸⁸. This chapter considers our meta-approach to retrieving and creating information in the pre- and post-Internet world. With this I highlight a shift towards the Chaos pattern of feedback and interaction in current approaches to information accessing and creation. The art projects which will be discussed in this chapter follow a similar pattern, implying a wider social context in which these patterns are prominent.

Let us proceed by comparing pre-Internet knowledge retrieval to the accessing of information in an Internet-dominated context. It is a truism that the Internet has profoundly transformed access to information. This is evident if one compares traditional access to knowledge via the printed page or the lecture hall to a computer-based learning experience. The former is expensive, cumbersome to use and maintain and requires the 'learner' to travel and arrange access to books. Decisions on what to include in libraries or lectures are tightly controlled by (mostly) trained professionals. Material is primarily collated from research done by a small number of leading scholars or writers or, in municipal libraries, is chosen on the basis of broad popular appeal. This means that libraries and lectures have an inherent conservative bias towards established, 'approved' information, implying that other information is not 'collected' and hence not made available. This content is almost exclusively unidirectional, predetermined and universal – tailored to a generic segment of the population, rather than to the individual. Such knowledge distribution operates in a broadcast mode, where 'broadcast' signifies the dissemination of information from a central locus of control.

In contrast, information on the Internet is, with laptops and net-enabled cell phones, potentially accessible anywhere, at any time. Access to information on the Web is often (though by no means always) inexpensive. With some notable exceptions, information available is the result of

⁸⁶ Gloria Origgi, ed., "Conclusion: How the Internet has Changed Our Cultural and Scholarly Practices," in *Text-E: Text in the Age of the Internet* (Palgrave MacMillan, Hampshire & New York, 2006), 201.

⁸⁷ P. David Marshall, *New Media Cultures* (New York: Oxford University Press, 2004), 1.

⁸⁸ Gloria Origgi, "Conclusion", 199.

a collective pooling of knowledge. This could be termed narrowcast, where narrowcasting is, by definition, the opposite of broadcasting. Narrowcasting allows for diffuse content production and distribution within a continuous matrix, in contrast to the central point-source of broadcasting⁸⁹. The proliferation of blogs serves as one illustration of how diffuse the Internet publication contributor base is. The blogging site MySpace had 300 million users in 2008. Cyworld, a similar Korean site, had 25 per cent of Korea's whole population and 90 per cent of all Koreans in their twenties as members⁹⁰.

In short, with the Internet makes information is (at least in theory) conveniently available any place, any time, at minimal cost. It represents not a pre-selection of information, but an indeterminably broad range of topics and approaches. This is a result of the proliferation of connection points between individuals and their sources of information. This proliferation of links works with the Chaos pattern of interconnectedness.

Let us consider changes in design conventions in publishing industries as one example illustrating the change from pre-Internet to Internet-accessed material, in terms of greater interconnection through the 'democratisation' of information access that the Internet has allowed⁹¹. Most paper-published information is tailored by a minority for what they perceive to be the wants and needs of a specific market segment. This pre-determination of appropriateness is communicated through a number of elaborate publishing codes which signify the hierarchical standing and value of a product. Tabloid magazines use recycled paper and lower resolution images, upmarket magazines such as *National Geographic* rely on high-quality reproductions on glossy art papers, and scholarly journals display 'seriousness' and objectivity through stark graphic design, the inclusion of bibliographic details on each page and heavy-gauge cardboard covers. With other words, the usage and 'type of discourse' for which such a paper-based text is intended is conveyed by the appearance of a publication. In contrast, the medium on which websites are read are the generic computer or cell phone screen, which occludes such prior identification as there are no established conventions distinguishing the pop-culture from the scholarly⁹². This lack of visual codes denies easy determination of the supposed suitability (and hence access point) of information, so that there is less self-censorship as people from far broader segments can and do encounter information which would previously not have been aimed at them. I do not comment on the quality or depth of information available on the Internet in saying this. I merely make the point that contemporary audiences are familiar with the availability of large amounts of unfiltered information brought about by a medium that works through Chaotic interconnection.

⁸⁹ Criticisms of this view lament the massive decontextualisation of information on the web. They contend that the format of most websites discourages in-depth contemplation through the superficial distraction/attraction of endless links and options. See Simanowski for a critique of the supposed openness and democratisation of the internet.

Roberto Simanowski, *Digitale Medien in der Erlebnisgesellschaft* (Hamburg: Rowohlt, 2008), 7 – 31.

⁹⁰ Lev Manovich. "Art After Web2.0," in *The Art of Participation: 1950 to Now*, ed. Rudolf Freiling. (New York: Thames and Hudson Inc. 2008), 69.

In 1974 Ted Nelson self-published the book *Dream Machines* in which he predicts open publishing networks for general public. Ironically his contemporaries ridiculed him, believing that there was no demand for a publicly accessible digital publishing platform.

Noah Wardrip-Fruin & Nick Montfort, eds., *The New Media Reader* (London & Cambridge: MIT Press, 2003), 301.

⁹² Roger Chartier, *Forms and Meaning: Texts, Performances and audiences from codex to computer*, (Pennsylvania: University of Pennsylvania Press, 1995), 3.

If the Internet has 'democratised' access to information, the creation of knowledge has been even more democratised⁹³. For reasons of cost and practicality, pre-Internet national and global publishing was restricted to a select few manuscripts. In the digital world, every net-citizen can self-publish on the Web and contribute to the endless store of knowledge which now makes 'our' culture. With web platforms encouraging anything from the publishing of book-length manuscripts to the 140 character commentary of Twitter, each individual with access to the Internet can publish his or her own news, current affairs, personal musings or other information⁹⁴.

To reiterate: the Internet allows for unprecedented accessibility to information, and not only permits but encourages the active creation of such knowledge by unselected, subjective and chance contributors⁹⁵, it results in an expectation of participation in information production and a familiarity with processing this unstructured information. Such participation within a dynamic system of knowledge production is consistent with the feedback and interconnection of Chaos Theory.

Before illustrating how the abovementioned 'new' attitudes towards information are paralleled in participatory art, I discuss Wikipedia and Google as examples of how Internet-inspired changes in information access and creation echo the Chaos pattern of interconnectedness and feedback.

One cannot help comparing Wikipedia with the 27-folio volume *Encyclopédie* edited by Diderot from 1751 to 1765. When Diderot set out to record and classify the objects of the world in one of the great Enlightenment projects, his aim was to represent reality using a framework which stressed knowledge as immutable and unquestionable. Wikipedia, the encyclopaedic project of our time, likewise records and explicates the world, but in an ever-shifting, incomplete narrative. Wikipedia is contingent and fragmentary because it is produced solely through continuous interconnection. Wikipedia is created by the multiple, voluntary, unsolicited postings of net-citizens – however experienced or knowledgeable⁹⁶. Unlike a conventionally edited text, each of the participants acts simultaneously as writer, editor and consumer of the information, so that their inputs feed back into the dynamic encyclopaedia. It is through the feedback mechanism of collective edits, deletions and additions to the site that information on Wikipedia is kept (mostly) accurate and acceptable to broad social norms. There is no pre-defined status given to any of the entries and what is considered a worthy subject for recording is solely determined by

⁹³ See Simanovsky for critiques of the suggestion that the internet functions though 'democracy' and interactive access. Simanovsky argues that the Internet is yet another manifestation of a globally controlling capitalism.

Simanonwski, 7 – 31.

⁹⁴ A somewhat bizarre version of this is the use of Twitter in some USA churches, such as Westwinds Community Church in Michigan. Here a screen behind the pastor flashes the Tweets the congregation sends from their cell phones during the sermon.

Bonnie Rochman, "Twittering in Church, with the Pastor's Ok," *Time* May 3 2009, <http://www.time.com/time/business/article/0,8599,1895463,00.html> [accessed 6 June 2009].

Web users are also familiar with intervening in other people's posts, be it through comments, reviews, ratings, gestures and tokens, votes links or badges, all of which are encouraged and asked for on most web-sites.

⁹⁵ The eradication of the distinction between production and consumption operates to the extent that one no longer speaks about 'producers' and 'audiences', but of 'users'.

Marshall, 9.

⁹⁶ Although Wikipedia does not recruit people to contribute to postings, they do have a range of standard messages which appear on sites which, in their view, need correcting or expanding. Wikipedia does at times 'freeze' a webpage if it is considered too contentious. The overriding image of Wikipedia, nonetheless, is one of greater access and openness.

individuals' interaction with what other people have previously published on the site. Here the Chaos imprint of interconnection and feedback is patent.

Like Wikipedia, the Google search engine allows access to and creation of information via the Chaos characteristics of interconnection and feedback. Whereas initially search engines based retrieval algorithms on the number of times a keyword appeared in any given text, Google uses further information, such as the number of hits and connecting links per page. Links are created by fellow web-users, so that the choice to link a page feeds back into the system, leading to greater prominence on the hierarchy of listed sites. This, in turn, increases the chances of further hits and links added by future users. When searching or posting on the Internet, each individual's choices feed back into the search engine to modify any future access to knowledge. Determining what becomes easily accessible and prominent on the World Wide Web thus happens within and relies on the interconnection of web users through creating a matrix of links between sites and the feedback of such links (and hits) back into the search-system⁹⁷. Google's business model is thus Chaos-based.

Wikipedia and Google are prominent examples of how information access and creation in a late twentieth century has not only fundamentally changed, but has done so in line with the Chaos Theory pattern of interconnection and feedback.

To return to participatory art, let us consider two projects by Mexican artist Rafael Lozano-Hemmer as an illustration of how participatory art mirrors the Internet-based approach to information (convenient access to a wide range of unstructured information) and Internet-based creation of information (through unsolicited collective contributions). The suggestion here is that in a milieu understood in terms of Chaos Theory, social memes have developed which raise expectations of interconnection and feedback in the creation and accessing of information. This finds parallel expression in the Internet and in participatory art projects.

For *Vectorial Elevation Dublin* (April 22 to 3 May 2004), part of European Union expansion celebration, Lozano-Hemmer installed 22 searchlights in Dublin's city centre. By logging into the *Vectorial Elevation* website, any net-citizen could determine the position of the light beams in relation to each other and the surrounding architecture. The resultant light-sculptures, each one lasting for fifteen seconds, were visible from a 15-kilometre radius, so that in effect the individual's contribution dominated and altered the capital city's skyline for the duration of his or her sculpture. A personal webpage was produced for every contributor so that they could share their design, and whichever other information they wished to share, through this platform. The contributor's name and personal message also appeared on a large screen in a central Dublin street while four webcams made images globally available. Not only were the dozen programmers, designers and technicians Lozano-Hemmer worked with an integral part of this project, but so were each of the many participants; in Lozano-Hemmer's words: "if people don't participate and add their own input the project does not exist" (People did not merely participate, they embraced the concept. In a Mexico City version of this installation, 800 000 participants from 89 countries made contributions over a two-week period)⁹⁸.

⁹⁷ Javed Mostafa, "Seeking Better Web Searches," *Scientific American* (February 2005) <http://www.scientificamerican.com/article.cfm?id=seeking-better-web-search> [accessed 10 July 2009].

The Web as a whole functions similarly to Wikipedia, except that here information does not necessarily get replaced by subsequent postings, but rather gets appended.

⁹⁸ Rafael Lozano-Hemmer, "Rafael Lozano-Hemmer" 2009, [http:// www.lozano-hemmer.com/](http://www.lozano-hemmer.com/) [accessed 3 July 2009].

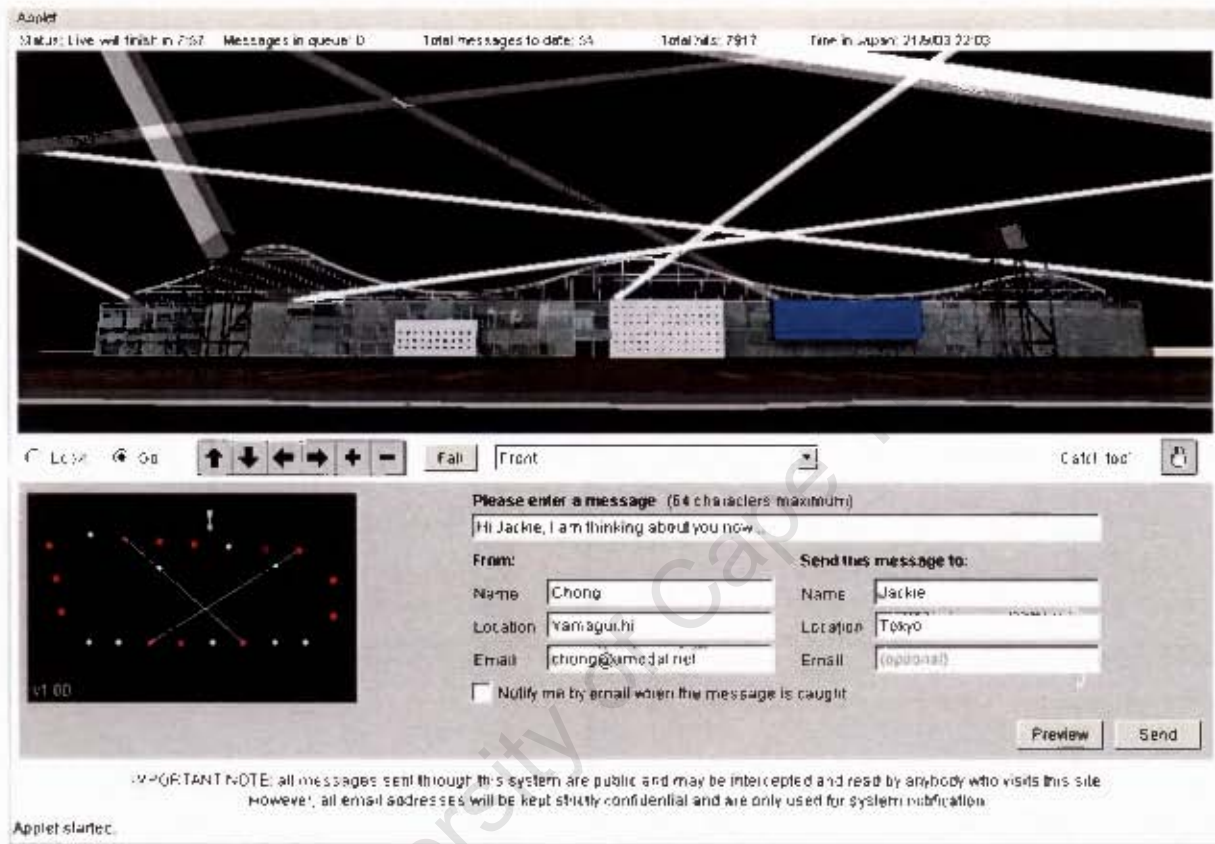
In 2003, Lozano-Hemmer created *Amodal Suspension* as a precursor to *Vectorial Elevation*. Again, searchlights created designs in the night sky, the difference here being that the configuration of the lights was an encoding of messages people sent to each other using a cell phone or web browser. Rather than being routed directly, these messages were redirected to this project before being delivered to the intended recipient. It is thus the interaction and feedback as people respond to each other and *Amodal Suspension* which gets visualised through the light show⁹⁹.



Lozano-Hemmer. *Vectorial Elevation, Dublin*.
2002. Dublin, Ireland¹⁰⁰.

⁹⁹ *Ibid.* The reasons for participating in this project were numerous, but endearingly in a Mexican version of this project held in 2000, 27 participants used the light sculptures and accompanying personal websites to make marriage proposals.

¹⁰⁰ Wikimages, "Vectorial Elevation, Dublin," http://farm1.static.flickr.com/158/439015460_05c547a172.jpg [accessed 8 December 2009].



Lozano-Hemmer, *Amodal Suspension*.

2003. Yamaguchi, Japan¹⁰¹.

As the quote by Lozano-Hemmer shows, creation here is an interconnective act, with each contributor designing what is perhaps a unique sculpture, but with the interconnection of these sculptures in concert with the surroundings and other aspects of the project forming Lozano-Hemmer's work.

Both *Vectorial Elevation Dublin* and *Amodal Suspension* presuppose audiences who are familiar with the idea of contribution and are willing to play such a contributory role, mirroring a wider social familiarity with (information) creation as an interconnected collaborative act. Each interaction with *Vectorial Elevation* resulted in a multitude of information on a variety of

¹⁰¹ Wikimages. "Amodal Suspension," http://www.sixty7architecture.com/storage/amodalsuspension_yamaguchi_05.jpg [accessed 8 December 2009].

platforms which was communicated by public screens, personal websites and the actual light installation. Through this, the project suggests an understanding of information as dispersed and widely available, echoing the diffusion of knowledge society as familiar with the internet and as supported by a Chaos framework.

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Chapter 6: Personalisation and Fragmentation in a Narrowcast Context

In Chapter 5, I briefly introduced the distinction between broadcasting and narrowcasting. This section of the dissertation looks at narrowcasting to point to a fragmentation and personalisation of information brought about by this narrowcasting. After illustrating this trend to fragmentation and personalisation through two examples, I relate this to some of the mathematical models explored in Section 1 before illustrating a parallel trend to the fragmented and personalised in participatory art.

To reintroduce the concepts of broadcast and narrowcast:

- Broadcasting operates from a central point source and unidirectionally sends information to a generic audience.
- Narrowcasting operates in a homogeneous continuum which allows for accessibility and relies on individual input to focus on a multiplicity of personal concerns, hobbies and fascinations¹⁰².

Traditional broadcast media are often described as 'mass media'. The expression 'mass' (according to Marshall, developed from nineteenth century sociology) suggests an otherness, if not inferiority, of the audience vis-à-vis the small minority of content producers and disseminators. 'Mass' conveys the idea that there is something unifying to 'the grouping'. The assumption that it is possible to structure programme content for a common denominator, designed to satisfy something within this mass audience, is implicit. Due in part to the costs involved in content production and dissemination, broadcasters tend to pre-censor what is of sufficient 'quality' for their medium, with the careful tailoring of programmes and the controlled messages this implies. The schedule, pace and content are, however, almost completely determined by the broadcaster, often under the sanction of a governmental authority¹⁰³.

¹⁰² The sales of iTunes illustrate this trend toward niche-audiences: in mid-2000's every track out of a million or so available on iTunes sold at least once every four months. This means that even the most obscure recording found at least one purchaser.

Lev Manovich, *The Language of New Media* (Cambridge & London: MIT Press, 2001), 68.

Niche-market audiences tend to be in different niches over time rather than a particular niche for all time.

¹⁰³ Marshall, 3 – 7.

This is admittedly a simplistic illustration of the shift from broad to narrowcasting: as Amelia Jones' concept of 'reading against the grain' indicates, audience engagements are far more complex than this. Take, for example, gay cultures' adoption of Kylie Minogue as an icon for homosexuality or Tori Amos' feminist inversion of Eminem's misogynist *97 Bonnie and Clyde*. Here 'minority groupings' use an aspect of mass-broadcast media to formulate a counter-identity, in opposition to the dominant and intended reading of cultural symbols.

Amelia Jones, 197 – 240.

Whilst much of cultural industry stresses the unitary nature of its audience - think of the double meaning of SABC1 television station's by-line "Simunye – we are one" - counter-readings show active audiences which express a plurality of identities in the way they approach, use and interpret media symbols. There is a perception that the *vox populi* expressed via the Internet counters hegemonic structures, leading to greater access to the power of knowledge and identity construction. Such a culture reacts thus to the theory of increased power, even if not necessarily to the reality of such.

Marshall, 16.

Narrowcasting exists because of personalisation and personalisation presupposes fragmentation. To illustrate the prominence of fragmentation in the current narrowcast social climate, let us consider the arrangement of information in paper-based versus Internet-based documents. A paper-printed publication, such as a book or journal, is read primarily in a linear manner, with footnotes, illustrations and appendices providing a parallel, secondary narrative. Internet-based texts are far more multimodal. Here, the word does not dominate the image (and sound). Words and images do not operate on a system of the dominant and supporting, but are intertextual, with each picture or text piece having an equal value or importance. Indeed, Web information is deliberately fragmented and joined by links to allow for ease of reading¹⁰⁴. The importance of these information segments is not decided by the author (who, in a traditional book, would establish chapter order and relegate some information to footnotes), but is determined by the user with each decision to click on a link, enlarge an image, or use rollover section. Readers can thus customise their experience on the Internet as they follow a unique path of research through virtually endless options of connections to other sites and pages. The deliberate fragmentation of information on the web allows the user to approach information like building blocks, where blocks from different sites can be easily and conveniently related to each other in a unique path of personalisation¹⁰⁵.

To relate the above to Chaos Theory, let us look at narrowcasting and the associated terms personalisation and fragmentation in terms of broad historical and mathematical trajectories. Whilst broadcasting was the medium of modernism, narrowcasting, with its multitude of voices and dissipation of authority, is the medium of the (post-)postmodern. Being unidirectional and centralised (rather than fragmented), broadcasting 'edits out' complications (such as dissenting or non-normative personalised views). To stretch this point: state broadcasting is Newtonian in that it creates an ideal universe in which distractions can be ignored. Commercial broadcasting caters for the 'average' in that stress is primarily placed on listener numbers per programme – denying the idiosyncrasies of personalisation. In this, broadcasting echoes the averaging of Statistical Mathematical models. Narrowcasting, with its emphasis on the importance of personalisation, allows each individual to alter a system by feeding personal needs and desires back into the system's expression and functioning. This means that systems are not finite and pre-existent, but rather are formed through interaction with each individual's needs and biases, and the feedback of these needs and biases into other net-citizens' personal expressions. The premise of this is feedback.

In recent year, traditional broadcasters have recognised the strength of the trend toward personalisation and have tried, as far as their medium allows, to incorporate some form of narrowcasting within their framework. Think, for instance, of the rise of reality television shows and SMS voting, allowing audiences to determine the direction of a particular programme¹⁰⁶. Within television programmes such as e-TV News, this imperative to personalise leads to a fragmentation as multiple stories are simultaneously offered to the audience. This news

¹⁰⁴ Roger Chartier, 3.

¹⁰⁵ As an aside: the division between the broad/ generic and narrow/ customised extends far beyond the World Wide Web. Even objects are explicitly manufactured to be personalised by users, so that a purchase is not a finite act, but an ongoing interactive experience addressing the particular needs of each individual. Anything from cars to computers can be tailor-made through a variety of add-ons and consumers are encouraged to write their own new applications for digital media - nearly 50 000 applications are available for the iPhone alone.

Josh Quittner "Google's Chrome: Taking aim at Microsoft – and the iPhone," Time (July 8 2009)
<http://www.time.com/time/business/article/0,8599,1909255,00.html> [accessed August 10 2009].

¹⁰⁶ The furore caused by a miscount of votes for the Idols television show in 2009 gives some suggestion of how important it is to these audiences to have their input acknowledged.

programme at times shows the talking news presenter, a signing presenter for deaf audiences, a video to illustrate the report and, at the bottom of the screen, a scroll bar with additional news stories.

To summarise: web-connected audiences of the late twentieth and early twenty-first century are increasingly comfortable with and demanding of highly personalised and consequently fragmented messages. If mainstream broadcasters have realised the potential, if not imperative, of addressing the expectations of a narrowcast-savvy audience, is this not also true of the arts¹⁰⁷?

To answer this question, let us consider how fragmentation and personalisation are fundamental to participatory projects such as *Utopia Station* at the fiftieth Venice Biennale (2003).

Curated by Molly Nesbit, Hans Ulrich Obrist and Rirkrit Tiravanija, *Utopia Station* is an exhibition, rest area, film and lecture venue, bathroom (with communal showers), garden, radio station, concert arena and quite a few more things rolled into one¹⁰⁸. The curators describe the envisaged physical appearance of this conglomeration of experiences and possibilities:

It has been important to all concerned that the plan [for *Utopia Station*] not present itself as a finished picture. (...) Along one side of [a] platform is a row of large circular benches [to] sit, so that you can watch the movement on the platform or silently turn your back or treat the circle as a generous conversation pit. (...) The circular benches are portable; as an option one could line them up like a row of big wheels. Along the other side of the platform a long wall with many doors rises up. Some of the doors take you to the other side of the wall. Some open into small rooms in which you will see installations and projections. The wall wraps around the rooms and binds the ensemble into a long irregular structure. (...) Outside the warehouse lies a rough garden. Work from the Station will spill into it. The Station itself will be filled with objects, part-objects, paintings, images, screens. Around them a variety of benches, tables and small structures take their place. It will be possible to bathe in the Station and powder one's nose. The Station in other words becomes a place to stop, to contemplate, to listen and see, to rest and refresh, to talk and exchange. For it will be completed by the presence of people and a program of events. Performances, concerts, lectures, readings, film programs, parties, the events will multiply. They define the Station as much as its solid objects do. But all kinds of things will continue to be added to the Station over the course of the summer and fall¹⁰⁹.

Exactly what form this 'exhibition' will take is not determined by the organisers, but rather by each of the sixty "artists and architects, writers and performers" in interaction with the audience, who are encouraged to "leave things behind, take some things with them"¹¹⁰. All contributors to the station were asked to produce a poster and short written

¹⁰⁷ Nam June Paik's *Participation TV* (1963) anticipated the trend away from information produced by a central locus of control when he let viewer interaction distort the broadcast image on the Cathode-ray tube. This work was remarkable at its time precisely because of the unusualness of being able to intervene in the broadcast message. Frieling, 98 – 99.

¹⁰⁸ Frieze Magazine, "50th Venice Biennale: Venice, Venice, Italy" Iss. 77 (September 2005) http://www.frieze.com/issue/review/jacob_dahl_juergesson/ [accessed 10 July 2009].

¹⁰⁹ Molly Nesbit, Hans Ulrich Obrist Rirkrit Tiravanija, "What is a Station?" (2003) <http://www.e-flux.com/projects/utopia/abput.html> [accessed 10 July 2009].

¹¹⁰ *Ibid.*

statement, so that a paper trail can lead to and from the installation. Through this, *Utopia Station* denies defined boundaries. The posters and texts are supposed to record ongoing conversations and debates and the formation of loose communities within the exhibition¹¹¹.

In this project there is no fixity or finality. Everything, from the intention to the furniture, is adaptable. The project of *Utopia Station* is re-enacted in very different form at various other sites in the world. *Utopia Station* is thus not one event or concept, but a number of different approaches, each with its own interpretation determined by the collaborators and visiting public. The art project does not pre-exist, but is shaped and conceptualised by the interactions between visitors and the feeding back of these interactions into the project. Like the World Wide Web, access to this exhibition is multinodal and intertextual, with no predetermined hierarchy to the order and status of various facets. Similarly, like the World Wide Web, the exhibition seems to function within and mirror Chaos patterns.

In *Utopia Station*, as with Web-based research, each participant overtly personalises his or her own path of discovery, independent of authorial direction, in a deliberately fragmented context. Whilst many art projects come with educational programmes, opening events or lectures attached, there is a clear hierarchy, with these being ancillary events to the show. The curators of *Utopia Station* reject such a hierarchy, seeing every contribution (by both invited and audience participants) as equally valid and important¹¹². The curator's descriptions make it clear that, to them, *Utopia Station* exists for and because of the feedback of the participants' personalised contributions – whether in the form of action, or the leaving behind or removal of objects. *Utopia Station* is, judging by the description, both chaotic and Chaotic, with feedback and interaction again being essential.

In summary: on the Internet, connections between pages, texts, sounds and images render Internet-based access to knowledge fragmented and relational, rather than linear and pre-determined¹¹³. This suggests an active participation in the structuring and accessing of knowledge, where the user of the Internet is not a reader but a co-former in the progression of arguments. This emphasis on the relational and on active co-forming presupposes a framework of interconnection and feedback, which is essentially a Chaos framework. Contemporary Internet audiences, exposed to this mode of working, operate with the same mental framework. On a theoretical level, participants in Lozano-Hemmer's projects or *Utopia Station* would not be uncomfortable with contingent, unstable meaning¹¹⁴. This is a mode of engagement that they are familiar with through contemporary Internet-based knowledge dissemination and through a wider prevalent framework in which Chaos characteristics are observable.

¹¹¹ *Ibid.*

¹¹² *Ibid.*

¹¹³ To a limited extent book indexes also allow for non-linearity.

¹¹⁴ I am speaking here for a particular audience of the actively Internet-engaged.

Chapter 7: Social Networking as Radically Interconnected Self-Affirmation

This chapter explores online community sites as both an expression of self-affirmation and, paradoxically, an understanding of life as a radically interconnected continuum. After explaining this apparent contradiction, I consider implications for art in a milieu where audiences are used to, and expect, such self-affirmation within an interconnected community. Using the same approach as in the previous chapter, I describe social networking sites at some length, after that relating these to Chaos Theory and to participatory art.

Online communities have become ubiquitous in the world of Web 2.0 with Facebook, just one of many such sites, having 250 million subscribers in 2009¹¹⁵. Let me briefly digress to explain the chronology of social networking sites. Whilst such sites are most commonly associated with Web 2.0, that is, with the user-content generated version of the Internet established in 2003, the first such sites were founded in 1994¹¹⁶. My aim is not to show that online social networking caused participatory art – which would be chronologically difficult to do – but rather to show that they are both expressions of the same social memes, brought about by a Chaos framework. The mode of interaction represented on social networking sites was conceived, implemented and socially adopted within a framework – what I argue to be a Chaos framework. Web 2.0 networking sites are the mature expression of this phenomenon.

Let us return to our main discussion by analysing Facebook as one expression of a wider ‘cult of self-affirmation’. In the words of Theodore Zeldin: “telling one’s own particular story and the fact of finding one’s own story interesting enough to tell in the first place is definitely a new (...) phenomenon”¹¹⁷. The format of most social networking sites is such that the self is the central focus. This is achieved through a diary-like recording of individuals’ thoughts and experiences. The numerous posted photographs serve as indexical markers of the individuals’ lives. Facebook is, in summary, largely about affirming the existence of the self.

But let us return to social networking as a radical interconnectivity. Such sites are always active. On social networking sites, conversations are continuous, between multiple people and based in the everyday individual life. One might log out of one’s Facebook site, but the conversations to you, about you and around you continue as your ‘friends’ – the members with whom you agreed to interact – keep posting, tagging and adding to your site. Cell phones operate in a similar manner. The constant presence of cell phones means that people are reachable, able to be informed of others’ doings, and able to inform them of their doings to an unprecedented extent.

I mentioned that Facebook can also be understood as radical interconnectivity. There is a confessional emphasis on authenticity as ‘friends’ vote to interconnect your sites with their site. In turn, being ‘voted’ onto a friend’s site means that your site becomes accessible to all the friends of this friend. The notion of ‘friends’, becoming ‘friends’ and the diary and thought-of-the-

¹¹⁵ Facebook, “Press Room Statistics,” <http://www.facebook.com/press/info.php?statistics> [accessed 18 August 2009].

¹¹⁶ Danah, M. Boyd, “Social Networking Sites: Definition, History, and Scholarship” <http://www.danah.org/papers/JCMCIntro.pdf> [accessed 4 February 2009].

¹¹⁷ Theodore Zeldin, “The Future of the Internet: A Conversation,” in *Text-e: Text in the Age of the Internet* (Hampshire & New York: Palgrave Macmillan, 2006), 91.

day format of Facebook suggest intimacy and privacy, whilst the information posted potentially spreads in a feedback effect to a numerically large and uncontrolled audience¹¹⁸.

Not only does this indicate a high degree of interconnectivity, but through this structure of interconnected friends, social networking sites tend to blur the distinction between public and private (cell phones are another example of such conflation of the public and private, as their mobility means that previously private phone conversations are now held in public). One could argue that new media thus present a new understanding of the public and the private¹¹⁹. The current generation is used to and expects involvement, interaction and public contribution.

Although it seems a contradiction, Facebook can be interpreted both in terms of a need for self-affirmation, and in terms of radical interconnectivity. Whereas the Cartesian 'I' suggested an individual whose connections to others radiated out from this central point, here the suggestion is that the individual is one point in a continuous, holistic and enmeshed matrix. Gilles Deleuze and Félix Guattari have written extensively about such a conception of the social as rhizomous. They suggests a shift away from a hierarchical understanding of the social to that of a complex, interwoven, inextricable web of relations. Such a network does not consist of individuals, but rather of multiple, enmeshed connections between individuals. The analogy is made to the rhizome, a plant stem which develops horizontally and creates new shoots and a tangle of roots wherever it grows. In contrast stands the image of the tree, which radiates roots, but with the purpose of supporting the central, hierarchically dominant plant¹²⁰. The rhizomous enmeshment of Deleuze and Guattari is an image for the world of Web 2.0, and it is this continuity and omnipresence of connections in the rhizome that both leads to and is celebrated in Facebook, specifically through the blurring of the public and private¹²¹. The importance and ubiquity of this rhizome means that if you absent yourself from this continuum, you 'cease to be'. To stretch this point, the individual exists only because of his or her enmeshment. This makes it important to announce the self continuously as part of this enmeshed network through posting about the 'me'

¹¹⁸ A setting is available to allow access only to immediate friends.

A similar sharing of the personal to a large audience, in a broadcast environment, is the proliferation of TV shows in which personal calamities and disagreements get 'psychologised' and worked through in front of a camera. The formula here is to have a set which suggests intimacy: the host has an informal and engaging manner and the set includes soft, enfolding couches which suggest a living-room atmosphere. In some programmes a small studio audience attends, making the appropriate conciliatory, approving or booing noises and here the participants often interact with and talk to such a studio audience. The actual larger audience sits at home in front of the television and, in the case of programmes such as Oprah, can gain numbers of 23 million each week.

Google Answers, "Q: How big is Oprah's Audience?" (10 July 2004)
<http://answers.google.com/answers/threadview/id/359070.html> [accessed 21 February 2008].

The on stage participants willingly participate in making the private a spectacle for public consumption. Unlike in the online, Facebook-type environment, however, these participants achieve their five minutes of fame and then disappear into history. Facebook attention is ongoing and (theoretically) everywhere. The sheer number of participants on network sites means that the individual retains the anonymity brought by crowds, in contrasts with television participants.

¹¹⁹ Marshall, 47.

Writers such as Simanowski have highlighted a more sinister aspect of this: they underscore the voyeurism, narcissism and exhibitionism of a culture of spectacle which allows for such a conflation between the public and the private.

Simanowski, 7 – 30.

¹²⁰ Gilles Deleuze & Félix Guattari, "A Thousand Plateaus: Capitalism and Schizophrenia," trans. Brian Massumi (London: Athlone Press, 1987).

¹²¹ Web 2.0 is defined by its user generated content.
Simanovsky. 75.

on the network. This explains the banality of most postings: the idea is not to stand out from, or rise above, the average of the rhizome, but to assert one's similarity and absolute enmeshment in the continuum of the rhizome through declaring that one does, feels and experiences the same trivia as everybody else. The cult of the 'me', understood in this way, is inextricably part of a Chaotic interconnection which is observed in social networking sites. The implication here is that of a continuum. The merger between public and private is just one example of how the net-citizen lives in a rhizomous enmeshment, where interaction with other people and other 'systems', and the feedback of these into one's own life, is expected.

If the social milieu is one of radical interconnectedness through the rhizome, then how do art exhibitions relate to this? Many 'traditional' art exhibitions address a static, physically passive audience. In effect, these exhibitions function in a broadcast mode with the artwork as central point. Take the ritual of going to an art gallery: the viewer has to come to a specific space where his or her experience is pre-scripted and tightly controlled (from noise levels to how much interaction there is with works on display). The aesthetics, lighting and staffing of the traditional white-cube gallery serve to enhance the sense that the artwork is the locus of meaning and that the audience is a mute and action-less participant whose role is reduced to witnessing. The formula of most galleries addresses a particular audience and presupposes a specific knowledge about how to act in such an institution and how to 'read' art.

This is very different to engaging with Rirkrit Tiravanija's participatory projects (and the gallery spaces they are presented in). For *Untitled (Free)* (1992) the artist cooked and provided free meals to any visitors to the 303 Gallery in New York. The art is the engagement between the Tiravanija and the visitors, as well as interactions between audience members. In mirroring daily life and interaction, this project reframes gallery spaces and denies art as a quietly contemplative activity. Tiravanija questions the idea of a static audience, replacing it with active, involved participants who value their own potential as contributors¹²². Barthes' concept of the active reader can perhaps be understood as a step towards such active engagement and personalisation, but this still operates on the level of the cerebral and individual.

I contend that the current milieu emphasises personalisation and interaction and understands the 'self' as equal to and rhizomously enmeshed with the rest of society and life. In such a continuum, the isolation and (physical) passivity of a traditional gallery experience gets replaced by the active engagement and contribution to participatory art. In such a way, Tiravanija's art project acknowledges and affirms the 'me' of the participant and assures his or her place in the rhizomous network through the symbolic act of sharing food. Sharing a meal suggests intimacy and acceptance into a group. Here, this intimacy is extended to a stranger – we again observe the blurring of public and private – in a manner that includes and affirms the 'me'.

If social networking, paralleled in Tiravanija's art, performs an 'interconnected continuum', then we are dealing here again with a phenomena which operates within a Chaos framework. Recall the discussion in Section 1, where I suggested that post-modern/ Quantum thought was based on disconnection. Here the Chaos framework shows an enmeshment and interconnection within a holistic, dynamic system.

¹²² Jerry Saltz, "A Short History of Rirkrit Tiravanija: Thai Artist who Cooks Meals as Installation Art," *Art in America* (February 196) http://findarticles.com/p/articles/mi_m1248/is_n2_v84/ai_18004723/ [accessed 2 September 2009].

Chapter 8: Experiencing Phase Change

Whilst most examples mentioned thus far consider Internet-related phenomena, this brief last chapter will look at the shift in post-industrial societies to an experience-driven economy. The implication is that the emphasis on experience in post-industrial societies, and the emphasis on experience in participatory art, both mimic Chaotic phase change. Before explaining this, let me define the term 'experience economy'.

In the last two decades, developed countries have shifted from industrial to post-industrial economies, with phrases such as experience economy used to sum up characteristics which would broadly fall within this economy type. The trend is tracked through the Gross Domestic Product of developed countries, where the service sector – providing experience 'commodities' – has become an increasingly important contributor. Inglehardt's World Values Survey has, since the 1990s, recorded a shift in emphasis from economic growth to lifestyle, a word that suggests aspirations beyond materialism to experience-driven development and entertainment¹²³. Whilst in an industrial society, status was linked to goods, here experiences progressively take on this role¹²⁴. As populations move beyond economies of scarcity, the primary decider in purchasing often moves away from necessity to add-on factors¹²⁵. Decisions on where to shop and what to shop for often have as much to do with the look of the mall - that is, the experience offered by the shopping centre - as with the cost, convenience and use-value of the wares offered in it¹²⁶.

Simanovsky writes that such an emphasis on experience, which he terms adult play and adventure, disrupts the traditional civil duties of planned foresight, rationality and time management. Whilst such duties are still stressed and valued, the settled arena they imply has fundamentally shifted. The hero of the 1950s was the father who spent long hours in a highly structured workplace (the same workplace for most or all of his life) to afford an occasional carefully planned package-holiday for his family. In contrast, the contemporary urge is to escape on a gap year of experience and excitement before embarking on a road of various careers in a number of companies. The emphasis on consultancy and job-change allows for ad hoc longer holidays. The high divorce rate implies that one will not always be accompanied by the same spouse and children. In fact, as children of divorcees move between their parents' households, they learn from an early age that settlement is not the fundamental it was assumed to be in the 1950s¹²⁷.

Here, life not understood as a stable, progressive, development. Instead of a constant trajectory, life is marked by abrupt changes, stops and starts. In Section 1, Chaotic phase changes were defined as such sudden adjustments. The previous chapter discussed small-

¹²³ Richard Florida, *The Rise of the Creative Class: And how it's transforming work, leisure, community and everyday life*. New York: Perseus Book Group, 2002), 180. This shift also reflects a concern with ecology.

¹²⁴ *Ibid.* 180.

¹²⁵ As an example consider MacDonaldis which often sells its meals not for the nutrition they offer, but for the add-on of toys and carefully designed in-restaurant play-arenas for children.

¹²⁶ *Ibid.*, 81.

¹²⁷ Simanowski, 18-21.

scale fragmentation of daily life and the larger-scale life changes alluded to here reveal a similar abrupt fragmentation, but operate in larger phases.

Phase changes are unpredictable and hence difficult to recreate in art projects. Let us nonetheless consider how Anthea Moys' *Nonsensical Obstacle Course* could be interpreted as mirroring the prominence of phase change as a factor of contemporary life. Tegan Bristow introduces her article on Anthea Moys' art projects with the sentence: "For Anthea Moys making art is a means to capture, demonstrate and remind all willing souls what it is like to simply play"¹²⁸. Like Simanovsky's description of the experience economy as adult play, so here the participatory art project is understood as adult play.

For *Nonsensical Obstacle Course*, which together with Bristow's *Shoot me if you can* was part of the *Have City Will Play* one-day event, the artist developed a series of games to encourage a playful interaction between strangers. The Mary Fitzgerald Square, situated in Johannesburg's notorious city centre, was closed to vehicular traffic as part of the Arts Alive festival and Moys had participants rediscover this space through three-legged races, climbing trees and building puzzles. By inviting unconventional behaviour in public spaces, Moys encourages the recasting of contentious and overly utilitarian spaces¹²⁹. It is the engaging, imaginative absurdity of the play which allows a dialogue between her, the public space and participants, as well as interaction between participants¹³⁰.

Whilst this is not an example of phase change per se – the experience is determined in advance and operates within pre-defined rules – the 're-invention' of the Mary Fitzgerald Square for one day could be seen as a playing at phase change in numerous ways. Firstly, the artist suggests how the square, and by extension other public spaces, could be utilized and 'thought' differently if a phase change in public attitude were to occur. A space which is ordinarily associated with crime and grime is here performed as wholesome, playful and family oriented. Secondly, participants in Moys' project were asked to interact and behave in an atypical manner from expected public behavior. Through this potentially cathartic and connected interaction between strangers, participants were given some sense of how they could potentially perform themselves differently. Both of these aspects hint at the possibility of a different phase from what individuals and society normatively function in.

Phase change in a Chaotic sense involves systems or matter abruptly changing their behavior for no prior observable reason. Whilst Moys' project is not stochastic and functions with pre-determined rules, to an observer ignorant of the artwork the unusual behavior of participants

¹²⁸ Tegan Bristow. "Play with Me," in *Art Southafrica* Vol. 6 Iss. 2 (Summer 2007): 34-35.

¹²⁹ Michael Smith, "Artbio Anthea Moys" *Artthrob* (May 2008) <http://www.artthrob.co.za/08May/artbio.html> [accessed 3 September 2009]. Tegan Bristow, 34-35.

¹³⁰ Michael Smith [accessed 3 September 2009].

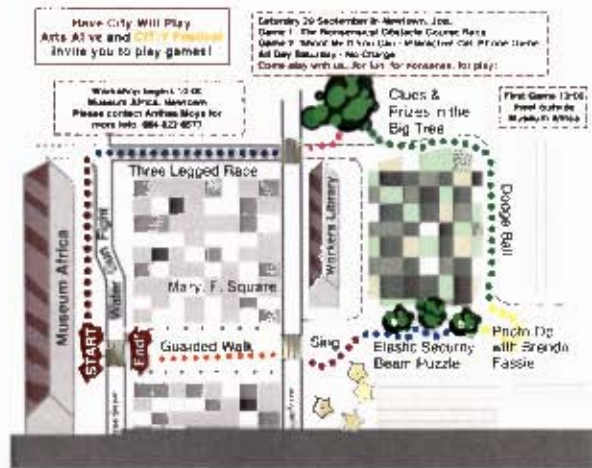
The emphasis on action and experience in interactive art such as *Nonsensical Obstacle Course* makes this the ideal cultural form of expression for the experience-driven milieu. Audiences used to the excitement of new experiences would probably be drawn to the action of Moys' projects over the quiet, gallery-based visual contemplation of a static artwork. Unlike most traditional two or three dimensional static artworks, such engagement is not just cerebral, but happens on a physical celebrated the physical.

Anthea Moys, "Projects 2007" <http://www.antheamoys.co.za/home.html> [accessed 13 August 2009].

The proliferation of large-scale art events also shows engagement with art understood as experience. Whilst the traditional gallery-show opening to a great extent had always been about the networking and the experience, rather than about the artwork, the notion of the art show as adventure experience gained huge currency in the 1990's. These events are not just about the art, but become a mixture of entertainment, education, networking and engagement.

would be a striking, sudden and unexpected inversion of normative patterns. With other words,

Moys' project mimics the patterns observed in phase change. *Nonsensical Obstacle Course* does not use phase change, but it suggests the unsettledness and instability of entertainment, where this instability suggests the possibility of a change in phases.



Anthea Moys, 2007, *Nonsensical Obstacle Course*. Map for event¹¹¹.

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¹¹¹ Tegan Brastow, "Have City Will Play." (17 September 2007) <http://www.atjoburg.net/?p=240> [accessed 12 September 2009]

Conclusion

Art historians look at how artistic expressions reflect contemporaneous physical and social contexts, that is, the concerns, belief systems, conventions and ways of being within society. In this dissertation, I suggested that one way of understanding the recent prominence of participatory art, whether in relation to newly produced projects or in a re-consideration of historical participatory art, is through looking at the common framework that underlies not only this art but also wider social memes in the current environment. In other words, I suggest that finding the common pattern between wider social and artistic expression allows us to speculate on the framework within which the current interconnected society functions.

Using Umberto Eco's model of linking Quantum Theory to 'open work' from the 1960s, I suggest a progression of this so that Chaos Theory now becomes a framework through which participatory art can be understood. Through this lens, participatory art can be observed in terms of prominent Chaos patterns, namely interconnection, phase change and feedback. Similarly, these Chaos patterns are observable in wider social phenomena. This is expected, as both operate within an understanding of, and an approach to, the world which is now understood to be suffused with Chaos patterns.

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