

## Chapter 7: Conclusion and Future Directions

The unity of which digital narratives speak (harmonious digital communities, immersion in cyberspace, holistic lifelike systems, the unity of the animate and the inanimate) reside in the future. Digital narratives commonly emphasize what will be accomplished while downplaying current achievements, which are inevitably more modest than the predictions. The grand narrative in this romantic teleology is of time-dependent progress, a surplus of expectation.

Richard Coyne<sup>821</sup>

This thesis has investigated the ways in which Responsive Environments have been used to evoke environmental responsibility through interactions between artist, artwork and audience. The investigation was broken into its constituent parts: How may A (creating Responsive Environments) be attempted so that B (Artist-Artwork-Audience interaction) may occur according to criteria C (the Responsive Environment evokes audience responsibility). In this formulation, the problem was seen to lie in C (negotiating between binaries inherent to Responsive Environments); the context for the investigation was B (Artist-Artwork-Audience interaction) and attempted solutions were explored in A (examples from my own and others' art practices).

In this thesis, I addressed two related gaps in contemporary scholarship. One has to do with the negligible critical analysis on Responsive Environments. The second is the lack of scholarly research on the relationship between Responsive Environments and environmental responsibility. In attempting to address these gaps, my thesis contributes to understanding the challenges of negotiating a balance between binaries such as authority-control, determinacy-indeterminacy, simplicity-complexity and narrativity-interactivity when creating Responsive Environments. While comprehensive solutions have been beyond the scope of this project, the suite of artworks and accounting for the process of their creation may be useful to similar practitioner-theorists and curators, critics and academics working in these fields of practice. In doing so, it contributes to the small, but growing, body of interest in bridging the gulfs

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<sup>821</sup> Coyne 2001:19.

between art, science and technology, analogue and digital art, and environmentalism and Interactive Art.

Negotiating a balance between the above binaries determines the competing and contending relationship between all elements in a Responsive Environment. Evoking environmental responsibility through the interaction between artist, artwork and audience was found to be determined by three principal ingredients - content, form and Interaction Design. How these ingredients are combined in the attempt to balance authority-control, determinacy-indeterminacy, simplicity-complexity and narrativity-interactivity and the ratio between responsivity and responsibility was found to be the pivotal challenge to evoking environmental responsibility in Responsive Environments.

Chapters 1 and 2 of this thesis identified and clarified the recipes and ingredients for creating Responsive Environments by situating them within their broader art historical and cultural frameworks and through analysis of practitioner-theorists' attempts to balance ingredients to create Responsive Environments (Chapter 2). Contrasting perspectives of 'external' reaction and 'internal' creation were used to conceptualise Responsive Environments according to the heterogeneous artforms, mediums and disciplines they incorporate.

Chapters 2 and 3 focused on the novel attempts of artists and artworks to evoke environmental responsibility when creating Responsive Environments. The five case studies in Chapter 3 explored these attempts through the careers of five significant artists/collectives. These studies illustrate various strategies to 'solve' challenges inherent to evoking environmental responsibility in Responsive Environments. The discussion considered how and why related artists use divergent combinations of content, form and Interaction Design to maximise complexity and interactivity, while reducing their authorial authority (and associated responsibility) and increasing audience authority (and associated responsibility).

Rather than posit a definitive 'solution' through any one artwork, artist or artform, my discussion of these several careers was able to demonstrate "a journey towards true interactivity"<sup>822</sup> with 'truth' lying in specific combinations

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<sup>822</sup> Paine 2002a:116.

of intuitive, counter-intuitive, satirical, “broad bandwidth”<sup>823</sup> or trammled interactivity. The case studies portrayed how each artist/collective developed context- and content-appropriate approaches to negotiating perceived polarities between rigidity and fluidity, real and unreal, Inside and Outside, and biological and human spatio-temporal scales to “inspire more responsive (and perhaps responsible) forms of design, engineering and social organisation.”<sup>824</sup>

This thesis was concerned with explicit and implicit responsibility to the social and physical environment of the artwork rather than efficacy of Responsive Environments to instill responsibility to quotidian and natural environments. Rather than ‘test’ if artworks ‘successfully’ evoked environmental responsibility, the thesis was concerned with potential evocation through combining content, form and Interaction Design, in creating rather than receiving art. The tensions between what responsibility artworks evoke, versus what artists desire their artworks to evoke, arises from the intractable rhetoric-reality disjuncture between ideal and real realms of Alife aspirations to “art-as-it-could-be”<sup>825</sup> according to “life-as-it-could-be”<sup>826</sup> and Blife aspirations for art-as-it-actually-is according to “life-as-we-know-it.”<sup>827</sup> These tensions were discussed in Chapters 4, 5 and 6, which demonstrated the myriad ways the rationale for the content, form and Interaction Design of my own PBR has been influenced by these artists.

The dissertation of this PhD also includes my negotiation between the realms of real and ideal in the conception and execution of my own suite of artworks, where interactivity and responsivity were but two (albeit major) elements in the totality of creation and production. Chronologically, they are:

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<sup>823</sup> Rokeby 1990.

<sup>824</sup> Kuzmanovic and Gaffney 2006:4.

<sup>825</sup> McCormack 2005a.

<sup>826</sup> Braeckman 1995:3.

<sup>827</sup> Helmreich 2000:224.

- 1) *Inverted Preverted* (2004-5), *D#Generative* (2004-7) and *Sly Drooler* (2004-5)
- 2) *Tat Avam Asi (Kali Yuga) v1* (2004) and *v2* (2005-8) (hereafter *KYv1* and *KYv2* respectively)
- 3) *StilmS v1- v3* (2004-5)
- 4) *Emergence v1* (2004), *v2* (2005) and *v3* (2007).

The accounts of the iterative development of these artworks in Chapters 4, 5 and 6 demonstrated content and context-appropriate strategies to address the problems inherent in interactivity and responsivity when these were major elements in creation and production. These accounts were provided to document my “journey towards true interactivity,”<sup>828</sup> which chronologically progressed from control over content creation and execution (in 1 and 2), to control over content with purposefully subjugated control over execution (in 3), to collaborative co-creation amidst dialogical engagement with multiple simultaneous variables (in 4). This development was shown to relate to four broad epochs in the development of Responsive Environments, as my suite of artworks were mapped to show the progression from Plastic Art (in 1), to non-linear single channel Media Art (in 2) to multi-channel semi-immersive performative-installation (in 3) to full scale multi-channel immersive installation (in 4). Similarly, my authorial responsibility shifted from a high level of control over singularly created content (in 1) to focusing on creating context through Interaction Design in increasingly collaborative works (in 4).

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<sup>828</sup> Paine 2002a:116.

Diverse interactivity and responsivity modalities were used, according to artwork-appropriate approaches. Chronologically they progressed from:

- 1) Implicit environmental responsibility in non-responsive but metaphorically interactive works
- 2) Indirect and metaphorical environmental responsibility for a single-participant in a “reactive environment”<sup>829</sup>
- 3) Direct, literal and instantaneous environmental responsibility for small group interaction in a semi-immersive Responsive Environment
- 4) Indirect, direct, literal, metaphorical, instantaneous and cumulative environmental responsibility for large group interaction in a highly immersive Responsive Environment.

My approach to evoking environmental responsibility was contrary to many of the artists discussed in Chapters 2 and 3, as I located narrativity and engaging audiences in corresponding interaction modalities as an indispensable means for evoking responsibility. To do so, I developed and refined the techniques of *Translucinary Recombinatronix*, *Intact Syntax* and *Arpeggiated Hierarchy* in the electronic works made for this PhD. These techniques denoted strategies for balancing interactivity and narrativity through negotiating tensions between discernable narratives through which ‘stories’ could be shared, and in so doing embracing context- and content-appropriate modes of interactive engagement.

Prioritising the negotiation between interactivity-narrativity and responsivity-responsibility over the trade-offs between simplicity-complexity and determinacy-indeterminacy delimited highly complex “open interactions”<sup>830</sup> as used in *Alife* and dialogical artworks, which offer greater scope for evoking responsibility through awareness of complex and indeterminate causality than narrative forms. However, over the course of this PhD I identified a future

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<sup>829</sup> Dinkla 1996:281.

<sup>830</sup> Willis 2005:4.

direction for my PBR that could embrace both my narrative based approach to Responsive Environments and elements drawing from Alife art and complexity sciences.

The future direction for PBR is discussed firstly with regard to current discourse about the direction practice appears to be taking and secondly, given that balance is always so elusive, in light of practices that anticipate imminent advances in Alife science, Artificial Intelligence and Complexity Sciences. Discussion then proceeds along the lines of Richard Coyne's appraisal, quoted at the beginning of this chapter, that "digital narratives commonly emphasize what will be accomplished." However this is only arguable by "downplaying current achievements," as evinced by the discussion of the artists and artworks cited throughout this dissertation.

Speculation about the future directions for Responsive Environments posits the possibility of balanced positions between artworks, artists and audiences, through artworks that operate along frail, fertile, porous and oscillating boundaries at the edge of chaos. The following conjectures about future directions consider 'evolving' artworks using 'dialogical' interactivity to evoke environmental responsibility in harmony with the myriad mutually exclusive considerations of aesthetics, form, function, medium and subject matter. In the conclusion of her PhD, Graham argued that "the use of the common language metaphor of 'conversation' encourages a very critical view of interactive computer-based artwork" as she found "none of the artworks examined was judged to have achieved 'Real Conversation'" which she reasoned was "a possibly unobtainable end point" despite being "a possible future aim."<sup>831</sup> The aim in this trajectory is to collapse "the boundary of 'real conversation' which currently cannot occur between programmed artwork and audience, but could occur between members of the audience." Graham speculates the matter may be not if this is theoretically possible but when it may become possible, as "any interchange approximating a real extended conversation of words would demand real artificial intelligence from a computer - an attribute which, despite the hype, has yet to be arrived at."<sup>832</sup>

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<sup>831</sup> Graham 1997:137.

<sup>832</sup> Graham 1996a.

Collapsing this “boundary of ‘real conversation’” would concomitantly collapse Inside and Outside environments, whereby interactivity in art would biomimetically model Rokeby’s quotidian examples of human-human verbal and oxygen-carbon dioxide exchanges, so that Inside interactivity would mirror the ubiquitous Outside where “interaction itself is banal.”<sup>833</sup> Like Graham, Rokeby sees this as leading from a dialogical basis toward artist-audience relations, which he, like Graham, sees as requiring forms of Alife and Artificial Intelligence within Coyne’s “grand narrative in this romantic teleology...of time-dependent progress” and “a surplus of expectation.”<sup>834</sup> Rokeby argues that to constitute “significant interaction” between artwork and audience would necessitate both being “permanently changed or enriched by the exchange.” The apotheosis in this regard would be artists occupying “the extreme position” of interactive artworks manifesting “learning and evolving systems” that utilise an “adaptive mechanism...for accumulating and interpreting its experience.” Rokeby acknowledges this is a largely unattainable ideal, the reality being a mimetic “form of evolution” through extrinsic “refinements and adjustments made by their creators” in lieu of their “responses to observations made of interactions between the work and the audience.”<sup>835</sup>

Such ‘evolution’ perpetuates the ‘omniscient observer’ status of the surveying and interrogating artist, who implements teleological “refinements” based on observations external to the artwork. ‘Evolution’ is through such means as producing entire re-iterations based on such observations, or modifying the work by night while it is open to the public by day. ‘Mutations’ in the emergent behaviour of such works do not evolve from within but at the discretion of “their creators,”<sup>836</sup> as Whitelaw argues that “many of the systems we think of as ‘evolutionary’ or adaptive begin to seem non-emergent” as “the system is open to its environment, through the tiny portal of Boolean logic opened by interface decision-making, but neither the rules of its computation nor the semantics of its mapping of environmental input are subject to

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<sup>833</sup> Rokeby 1996.

<sup>834</sup> Coyne 2001:19.

<sup>835</sup> Rokeby 1995a:137.

<sup>836</sup> Rokeby 1995a:137.

mutation.”<sup>837</sup> Nonetheless Rokeby saw such aspirations as driving the future direction of practice, writing in 1995 that “learning mechanisms in interactive works will no doubt become increasingly common,”<sup>838</sup> even if, 15 years after this speculation and a year before the speculation by Graham quoted above, this remains a largely unobtainable ideal. McCormack similarly speculated, in 2004, about the “rich” potential for these endeavours to explore the possibilities of “art-as-it-could-be, artworks that are autonomous, genuinely novel, emergent, active, self-renewing and never-ending.” However he also remarks on the discrepancy between ideal and real realms for while he has seen artworks that “have given us glimpses into these possibilities, such lofty goals remain intangible at present, and with no guarantee of success. It remains for future generations of generative artists to determine if any of these goals will be achieved.”<sup>839</sup>

Like Graham and Rokeby, McCormack sees future directions as contingent on imminent scientific advances. He argues that “if you’re going to create systems that have any claim on being called living, then a lot more needs to be done, and that just doesn’t seem possible at the moment.”<sup>840</sup> Similarly, Armstrong argues that “significant interaction might be achieved if a work were able to learn, and hence evolve, throughout the experience.” He concurs that while “this might seem an impossible task with existing computer tools, it is worth remembering that much of the complexity of response and operation can be brought to the work by the audiences themselves.”<sup>841</sup>

In the light of these writers’ reflections which were expanded on throughout this dissertation, this thesis concludes with, and has made possible, my own formulation for the development of a framework for research and practice towards heightened evocation of environmental responsibility in the creation of Responsive Environments. It is beyond the scope of this

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<sup>837</sup> Mitchell Whitelaw. ‘Tom Ray’s Hammer: Emergence and Excess in A-life Art.’ *Leonardo* Volume 31(5). 1998:380.

<sup>838</sup> Rokeby 1995a:137.

<sup>839</sup> McCormack and Dorin 2001:13.

<sup>840</sup> Jon McCormack. ‘Notes: Artificial Life.’ *Jon McCormack’s Website*. 2001. [www.csse.monash.edu.au/~jonmc/resources/notes/alife.html](http://www.csse.monash.edu.au/~jonmc/resources/notes/alife.html). Accessed March 12 2008.

<sup>841</sup> Armstrong 2002:265.

dissertation to describe the specificities of this framework, however the following outlines my first principles for further development.

### **re.al**

will be the name of the artwork, as the acronym ‘real’ stands for Responsive Environments of Artificial Life.

### **er.re**

will denote the subject of the artwork: environmental responsibility in the Responsive Environment. Phonetically the acronym reads as “error,” signifying the impossibility of balance and inevitability of error as the modus operandi for the conditions by which the work ‘evolves,’ ‘learns’ and ‘adapts,’ according to the error threshold which precedes first principles in the mechanisms of biological evolution.

### **5e**

‘5e’ will stand for the five keywords which describe the intertwined approach and subject matter of the project. They are:

- 1) error
- 2) evolution
- 3) ecosystemics
- 4) emergence
- 5) ethics

Identified through the process of practice and research undertaken for this PhD, this future direction will continue to develop and refine the evocation of environmental responsibility in the creation of Responsive Environments, according to the foundation stones laid thus far.