Reconciling *experimentum* and *experientia*:
Ontology for Reflective Practice Research in New Media

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Abstract:
For researchers working at the nexus of the techno-scientific and the artistic, recent ontological theory that redefines the virtual condition is useful. This meta-theory is coupled with Pickering's notion of temporally emergent practice as a "dance of agency", where experimental goals are tuned to accommodate experience. Philosophical groundwork to underpin a hybrid methodology appropriate for practice-based new media research is outlined. It is suggested that the author's own research presents a fractal of this more generic concern.

Only recently have we in Australia begun to define the creative in the context of 'research'.[1] For those working at the nexus of the techno-scientific and the artistic, the institutionalised schism of the sciences and humanities can prove to be a hindrance. My own search for an appropriate ontological approach on which to base methodology has lead to this reflective paper on the topic. The emergent nature of the research objectives in my own practice is portrayed. That practice may be considered a fractal of a broader and more generic concern of contemporary philosophy. The technological is positioned in anthropological isomorphism with the socio-cultural. An analysis by Andrew Pickering of scientific practice as a temporally emergent process of engagement with material agency is presented as being useful for understanding the position of the practitioner in the case of hybrid technology and creative-production research projects.

Arising out of his experience supervising PhD researchers in art and design at Coventry University, U.K., Stephen Scrivener has published a series of papers about practice-based research. Working with students across the fields of design and art Scrivener identifies two main categories of project-based research:

- technology research: (problem-solving), e.g. robotic solutions

- creative-production research: (primary interest is production of artefacts) e.g. exhibition.

Scrivener contends that the norms of these research categories are quite distinct, and are summarised in the following table:

Comparing the norms of technology research projects and creative-production research projects	
Technology research projects	Creative-production research projects
Artefact is produced.	Artefact is produced.
Artefact is new or improved.	Artefact is of high quality and original in a cultural, social, political or/and aesthetic, *etc.*, context.
Artefact is the solution to a known problem.	Artefact is a response to issues, concerns and interests.
Artefact demonstrates a solution to problem.	Artefact manifests these issues, concerns and interests.
The problem is recognised as such by others.	These issues, concerns and interests reflect cultural, social, political or/and aesthetic, *etc.*, preoccupations.
Artefact (solution) is useful.	Artefact generates apprehension.
Knowledge reified in artefact can be described.	Artefact is central to the process of apprehension.
This knowledge is widely applicable and widely transferable.	The creative-production process is self-conscious, reasoned and reflective.
Knowledge reified in the artefact is more important than the artefact	Knowledge may be a by-product of the process rather than its primary objective

Table 1: Adapted from Scrivener (2000) and Scrivener & Chapman (2004)

Scrivener says, "A creative-production project may comprise some problem solving and may involve cultural theory, cultural history and scientific research *inter alia*." Even so, it is inappropriate to obfuscate, that is, to claim that one is the same as the other. Also it is necessary to avoid creative-production methodology being subsumed

under technical production methodology, especially as the latter has a longer research tradition and well-established norms (Scrivener 2000).

So how then are we to consider the norms of those research projects that are hybrids, situated in between these categories and possibly sharing some of the norms of technology research projects and creative-production projects that Scrivener identifies? This is the category in which many multimedia and new media research projects fall. It is clear that in new media practice there may be a requirement for engaging with technological solutions, creative production considerations and, very often, social and cultural issues otherwise significant to media and communication studies. This results in new media projects being proposed in typical configurations such as: communication projects that utilise existing technologies in new ways; projects where the technological development itself is innovative; and projects that propose a specific communication objective and involve artefact production and evaluation. A common denominator across them all is an engagement with the material of technology. And here the physicality of the seemingly most abstract of digital calculations and processes is to be stressed, for this is a key to an argument to be developed in this paper.

In addition to technological engagement there is another aspect that many of the hybrid technological and creative production projects of new media research share—they are experimental. It must be emphasised that the use of the term *experimental* differs from the understanding of the word derived from the textbook version of scientific practice, where one first proposes a hypothesis and then devises experiments designed to prove it. The usage here is reflected in the sapience inherent in the common root of the Latin words *experientia* and *experimentum*—the verb *experiri* which means to try, to risk, to put to the test, to challenge. Along the philosophical trail to modernity, experience has become more associated with qualitative matters subject to judgement, and experiment is more associated with the quantitative and rational separation of judgement.[2] Such assumptions are called into question by the perspective presented in this paper. Such questioning is also at the root of reflective practice.

In relation to the dominant research methods, reflective practice is distinct. The premises of reflective practice create some tension with them all:

Scholarly Discourse

Qualitative Method   >   <   Quantitative Method

Reflective Practice

Donald Schön believed that the epistemology of the dominant rational/experimental model was limiting, especially in situations of social change. He proposed a combination of reflection-in-action and reflection-on-action similar to, but different from, the methods of both scholarly work and controlled experimentation as being suitable for training the expert (Schön 1983). There may still be aims and objectives and quantifiable and qualifying outcomes, but such projects ideally involve, as John Dewey put it, "the persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it extends" (Dewey 1910: 6).

The cross-disciplinary expertise involved in much practice-based new media research involves development in *experimental* and *experiential* dimensions. A reflective practice approach will ideally keep the researcher oriented to this dual endeavour. However, perhaps more significant to the argument of this paper, are recent philosophical arguments advocating a fusion between theory and practice, acknowledging the idea that we not only know things but we also act amongst them, as exemplified by the Critical Realism of Roy Bhaskar.

Stipulating strict criteria regarding evaluation of outcomes, Scrivener claims that reflective practice is an appropriate methodology for his creative-production PhD students, but he believes his technology project PhD students operate under

different auspices. Whilst this approach may result in a more efficacious set of criteria for creative-production researchers than if they were to struggle to answer to the same criteria as the technologists, it may be argued that such an approach is not philosophically robust. It certainly is not helpful for those new media researchers working in that hybrid zone where the geek and the artist (Gibson 2000) come together and, indeed, may be one and the same person.

It is not my intention to suggest alternative criteria to Scrivener's in this paper. Rather I intend to highlight an approach that has epistemological and ontological grounds to provide the basis for constructive thought on this matter. It arises out of the work of Andrew Pickering, who observed practice in experimental science laboratories. A big difference between Pickering and reflective practice proponents is that the former doesn't refer to *reflective* practice, as such. He calls it *temporally emergent* practice and he specifies that it occurs at the technological interface in response to what he calls "material agency" (Pickering 1995).

Andrew Pickering may be identified with the sociology of scientific knowledge (SSK) discipline. If this discipline has given rise to a literary genre then it could be said that works by authors such as Michel Callon, Bruno Latour and even, perhaps, Donna Haraway, to name but a few, are constituent. Writing about SSK as a 'school', John Law says that it is "methodologically relativist", and that its proponents believe that "[t]here are no general, outside-of-context reasons for preferring one paradigm over another". He says that they claim we are always 'in context' and cannot get out of it. As a result, claims Law, SSK is "politically variable". Since the differences between esoteric knowledge, science and common sense culture are pragmatic, not differences in kind, SSK is egalitarian and non-exclusive (Law 2004: 3).

Pickering calls his theory about the nature of technological engagement in the laboratory *the mangle of practice*. Observing scientists, he asserts there are two senses of 'practice':

- "the work of cultural extension and transformation in time," and,
- "specific, repeatable sequences of activities on which scientists rely in their daily work." (Pickering 1995: 3–4)

The activities to which Pickering refers can be considered grammars of practice. These grammars are rule-based forms of setting up experimentation (Bruton 1998) and may also be observed in other fields of endeavour. This is particularly so in much new media creative practice where there is a rigour of procedural engagement with software tools and/or algorithms. Commenting on the two-way agency involved in this kind of practice in science Pickering says that it is "routinised and disciplined, 'machinelike'— it works both ways." (*ibid*: 16)

This is where Pickering's theory gets interesting and, possibly, difficult for some, because he proposes the existence of "material agency". Explaining this concept he says that the world is filled with agency. The world is continually *doing things* that bear upon us as "forces upon material beings. Much of everyday life "… has this character of coping with material agency—agency that cannot be reduced to anything within the human realm." (*ibid*: 6) There exist important parallels and a "constitutive *intertwining* between human and material agency." (*ibid*:16) He emphasises the intentional structure of this relationship, pointing to the "temporal emergence of plans and goals and their transformability in encounters with material agency." (*ibid*:18) Pickering says, "Human intentions are bound up and intertwined (in many ways) with prior captures of material agency in the reciprocal tuning of machines and disciplined human performances."(*ibid*:20) Pickering is talking here not only about what happens when things don't work as planned, but also about the process whereby the experimenter takes in the feedback that is received from the project, the mechanism or the device and, on the basis of experience, makes modifications, sometimes even to the objectives, in order to achieve a result that 'makes sense' under the circumstances. Pickering specifically draws this conclusion from historical analyses of scientists' notebooks, but he could be describing how software development and multimedia projects are

adjusted during the iterative regime of cycles of planning, implementation, appraisal and review.

He calls this process "tuning" and observes that tuning can transform the goals of scientific practice. In other words, he claims that the scientists he observed in experimental practice readjusted their objectives in the face of circumstances. Interestingly, Scrivener (2000) makes a similar claim about technical problem solving research projects. He says that "[t]ypically, the experience for much of the programme of study is one of false starts, readjustment, redefinition and uncertainty, *inter alia*."

Pickering's metaphor for the process of tuning in goal-oriented practice is that of a *dance of agency*.

> The dance of agency, seen symmetrically from the human end, takes the form of a dialectic of resistance and accommodation, where resistance denotes the failure to achieve an intended capture of agency in practice, and accommodation an active human strategy of response to resistance, which can include revisions to goals and intentions, as well as to the material form of the machine in question and to the frame of gestures and social relations that surround it. (op. cit: 22)

Pickering maintains that human agency is "emergently reconfigured in its engagement with material agency" and that both are "temporally emergent". He argues that whilst the "trajectory of emergence is bound up with that of human agency", material agency is not reducible to human agency (*ibid*: 53–54).

Clearly, at this point, in order to find the "dance of agency" metaphor workable in relation to understanding the nature of reflective practice generally and with specific regard to the field of focus in this paper, Pickering's notion of "material agency" must be put to further scrutiny. He says, "Material agency does not force itself upon scientists. There is […] no such thing as a perfect tuning of machines dictated by material agency as a thing-in-itself; scientists […] never grasp the pure essence of material agency. Instead, material agency emerges via an inherently impure dynamics that couples material and human realms."

The idea that technology is the dynamic interface of the physical universe and human actuality is supported by Bernard Stiegler's anthropologically derived argument that the human and the technical co-evolve:

> The zootechnological relation of the human to matter is a particular case of the relation of the living to its milieu, the former passing through organised inert matter—the technical object. The singularity of the relation lies in the fact that the inert, although organised, matter qua the technological object itself evolves in its organisation: it is therefore no longer merely inert matter, but neither is it living matter. It is organised inorganic matter that transforms itself in time as living matter transforms itself in its intersection with the milieu. In addition, it becomes the interface through which the human qua living matter enters into relation with the milieu. (Stiegler 1994: 94)

In order to make clear why these ideas are significant to a discussion about practice-based research appropriate for the sort of hybrid projects that are undertaken in the field of multimedia and new media, the inclusion of a personalised account of my own doctoral engagement is justified. Indeed, as Pickering says: "The practitioner's accounts pose no problem for analysis of practice - they should themselves be seen as products of the dialectic of resistance and accommodation, at once retrospective glosses on emergent resistances and prospective elements of strategies of accommodation." (*op. cit*: 53)

I shall be reflecting upon my experience of an engagement that from the outset was considered experimental—not in the sense that there was a hypothesis to prove or a specific question to answer, but because, rather, at the outset there were a set of objectives for the production of an artefact. Along the lines of the characteristics identified by Scrivener and Chapman (2004) for the creative production research model, a "self-conscious, reasoned and reflective" approach was established. An exegesis was planned. The research strategy was to purposefully engage in a grammatical method from which relevant ontological considerations could emerge. In this sense the philosophical outcome could not be understood in advance of the

practice. The artefact proposal had elements of the technology research project as described by Scrivener (2000). However it involved the use of existing, emerging and converging hard and software technologies in new and experimental ways, rather than the invention of a new process in itself. As this approach doesn't clearly match one or other of Scrivener's categories, I suggest that this research project as a whole may be considered a hybrid.

One unusual aspect of the project is its historical dimension; that the significant academic milestones in its long gestation have coincided with a chronology of phases of new development of fine arts-based tertiary awards in South Australia. The 1998 Master of Design award proposal was built on an earlier body of work that had been produced for a final year undergraduate project in 1980, at a time when the first wave of university-based fine arts (photography) degree students were graduating from the University of South Australia. In 1998 the masters award was a new development, and when the candidature was upgraded to PhD in 2003 it was one of the first visual arts (by major studio project) doctoral award proposals to be approved by the university. Thus the supervisors of the research candidacy were themselves pioneers. Now that I have graduated and am myself responsible for supervising researchers, my preoccupation is to formalise methodology appropriate to this hybrid field which my supervisors and I have tentatively explored.

My masters project was an experiment in hypermedia documentary. The original proposal was for a prototype website incorporating photos an accomplice and I took in 1980 of Adelaide's Torrens River, focussing on its bridges, and new digital images of the same scenes in 2000. The concept was to enable a comparison of images to show how the urban riverine environment had changed over time and to link to historical material and other available webs and databases about the river. The completed hypermedia prototype enables users to virtually traverse the Adelaide plain and, using the bridges over the river as vantage points, to toggle between old and new views. The artefact and exegesis completed to that point would have satisfied the criteria for masters level examination. There was a comparison of traditional photo practice

with digital photo-media practice and an attempt to take account of the convergence of

image formats and digital interactivity through defining the whole sphere of activity as 'hyperimage' (Holmes 2000). There were some technical issues resolved in the process. However, in due course, as I reflected in and on my practice, I was drawn more and more into the theory of new media—particularly regarding embodiment in computing and its social and political implications (Holmes 2003).

I also became fascinated with how a naturally occurring entity becomes culturally defined. The River Torrens is actually several rivers. Firstly, there is the waterway that has worn its course over geological time. Then there are competing social and technological, culturally constructed, versions of the river. These also change over time, along with social and political concerns and objectives. There is clear evidence in the documentary that these socio-political forces had been at work during the twenty intervening years between the first "Bridging Adelaide" documentary (Holmes & Blake 1982) and "Bridging Adelaide 2001." For example, one can observe: the removal of exotic flora species and the replanting with natives; the stabilisation of riverbank erosion; the creation of the Linear Park; the construction of the O-Bahn guided busway transport corridor; pollution control, particularly in the form of buffer zone ponds to filter and

Figure 1: University of South Australia Footbridge, West View, 1980: Holmes A. M. & Blake G. as reproduced in the "Bridging Adelaide 2001" hypermedia documentary prototype (Holmes 2004)
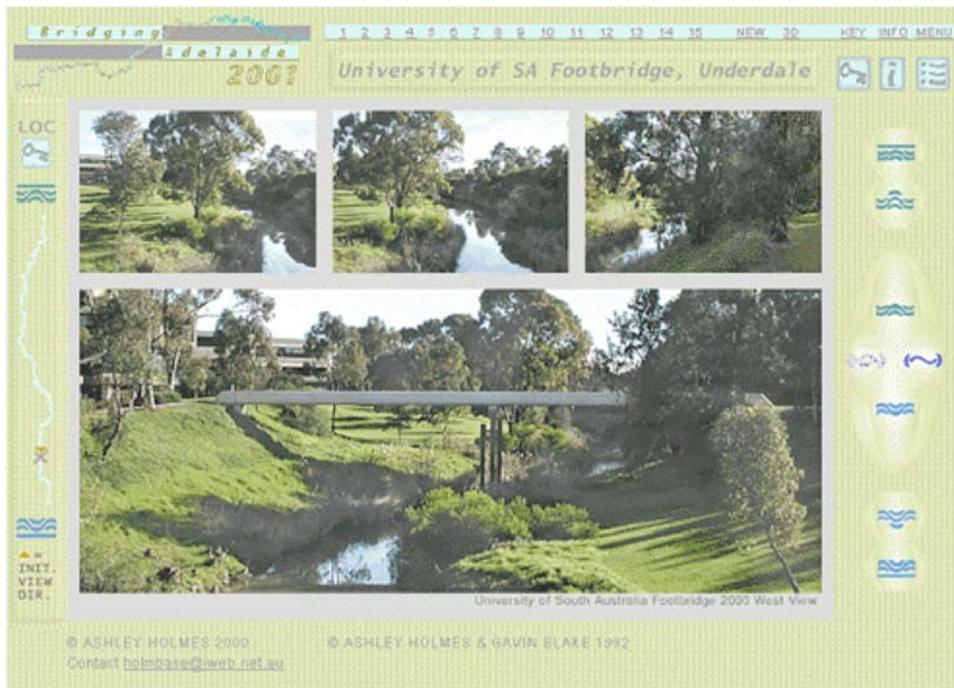
Figure 2: University of South Australia Footbridge, West View, 2000: Holmes A. from the "Bridging Adelaide 2001" hypermedia documentary prototype (Holmes 2004)

clean suburban runoff. In many ways the images tell a good news story. One can see the results of the environmental and social studies that have informed public policies[3] that were defined in the 1970s and implemented during the 1980s and 1990s. The Torrens Valley and the urban catchment have evidently been re-invigorated.

The upshot was that, in 2001, as I finished the masters project and exegesis I initially set out to produce in 1998, I was not nearly finished with the theoretical implications that arose for me out of that work. I successfully applied for an upgrade to PhD. This involved supplementing the project with a 70,000-word thesis. Even as I was embarking on this extended work, the University of South Australia was in the process of formulating its requirements for people in my specialty. I believe that now the recommended length of a thesis that accompanies a major studio project is around the 30,000 mark.

In my pursuit of what was essentially an engagement with discourse for the purpose of establishing the "authority" of documentary hypermedia—in the light of arguments about the unreliability of the digital image—a major consideration that emerged was to resolve an ontology of virtuality. This concern had implications for my interest in embodiment in computer mediation and in relation to the socio-political determination of 'naturally' occurring entities. This may be summarised as the relationship between the real and the actual.

In this sense, I understand that there is a distinction between the universe and our knowledge of the universe. The *real* corresponds to the universe and the *actual* to our cultural understanding of it. The *virtual* can be seen as an ontological condition that embodies characteristics of the translation between the *real*, the *actual* and the *potential*.[4]

In relation to the documentary concern in my thesis, I concluded that the ontological relationship between the representation and its source (signified and signifier) is not

governed by the physical form of the artefact of mediation (neither by silver grains or nor by pixels) but rather through the process of virtualisation. In mediation the virtual 'carries' with it, through the cycle of ontological states, the intentionality of the framing of the synthesis of production, and 'releases' it to the intentionality of the spectator in semantic synthesis.

This is not the appropriate forum to elucidate these ideas in depth. My point is that what eventually transpired in the context of my practice-based research is something that wasn't specifically envisaged at the outset. Indeed, it was only through the rigorous practical engagement with the technological issues at hand, in tandem with a sustained scholarly reflection, that the questions that turned out to be important in relation to the endeavour revealed themselves.

This observation concurs with Pickering's assertion that, "[o]nly after resistance has been successfully accommodated does it become possible retrospectively to locate it in, say the deficient performativity of a machine or a faulty human practice or an unattainable goal or a miscalculated conceptual structure." (*op. cit*: 54: note 15)

Pickering claims that his *mangle* theory of practice is:

> … objectivist, relativist and historicist all at the same time […] the objectivist and relativist positions are isomorphous in their insistence that something substantive and enduring (nonemergent)—rules, interests, worldviews, or whatever—is, or should be, responsible for closure. …Instead of appealing to anything substantive and nonemergent to explain closure, the mangle points to temporally extended processes—to machinic, conceptual, and social maneuverings in fields of material and disciplinary agency, and to stabilisations and destabilisations of cultural elements and strata. (ibid:194)

Pickering's theory could have broad application in the field of new media and multimedia where the focus of the discipline is at the technological interface. However Pickering should be taken to task over the semantic exclusivity of the term he uses to describe the resistant agency which he attributes to the *material*.

Applying new theories of the ontology of virtuality it is now possible to avoid the hesitation of Malcolm McCullough in his otherwise astute analysis of computer-based creative production, *Abstracting Craft, The Practiced Digital Hand*: "… despite the lack of physicality there exists *a growing possibility* of constructing the experience of a medium in the world of the computer." (McCullough 1998: 215) The emphasis in this citation is mine and it serves to highlight the profound uncertainty that still pervades our understanding of non-material digital processing and virtual artifacts.

Notwithstanding this reservation, Pickering's metaphorical account of reflective practice may be useful for new media researchers as it provides an epistemological basis for accounting for the considerations that emerge at the technological/social interface.

The primary difficulty in effectively analysing one's own work as practice and as an artefact, arises from the impossibility of altogether stepping out of oneself to take a look from another perspective. Unlike the situation where one is deploying an avatar in a virtual world or a computer game and one can switch points-of-view at will—first person, second person, omniscient (eye of God), or over the shoulder—one's perspective is always the same. Because conceptual and practical engagement with the work is built up over time it can't really be thought of as a fixed point-of-view either. It can be practically impossible to start right out and say definitively, "this is what I am doing and this is what I will end up with." If you knew what you were doing and how things were going to turn out from the outset, then why bother doing it? This is why Pickering's mangle metaphor of temporally emergent practice is so appropriate. One sets aims and objectives and pursues them, one works within the rigour of a grammar of practice. In the face of what is discovered, and in response to the continual conceptual reflection, one re-orients, or as Pickering says: tunes ones goals, and accommodates. This is the *experimental, experiential* approach.

Conclusion

There is a need for more efficacious guidance as to methodology suited to pursuits that straddle definitions of the technical project and the creative-production project as described by Scrivener. This is difficult to achieve without first addressing the meta-theory. Pickering's observations of experimental scientific practice as a dialectic of resistance and accommodation apply to experimental practice outside of the field of science, where the grammars and rigors of reflective practice as described by Schön are evident. Scrivener's work in identifying unique norms for creative-production (2000–2004) is perhaps more useful for a fine-arts approach than for multimedia technical and creative projects. His acknowledgment of the need for negotiation of hybrid norms and outcomes is appropriate. It is in this direction that I believe multimedia students should be encouraged. This hybrid approach could incorporate aspects of the considerations that Pickering describes as inherent in the *dance of agency*, tempered with a more ontologically useful understanding of the virtual condition.

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Biographical statement

Ashley Holmes is a lecturer in multimedia at Central Queensland University. He was recently awarded a PhD Visual Arts (Major Studio Project) by the University of South Australia for a thesis comprising artefact and written components entitled "*Bridging Adelaide 2001*: photography and hyperimage; hypereality and the documentary". In 1998 he embarked on an academic career after twenty years of commercial activity in South Australian design and multimedia production houses. Dr Holmes maintains an engagement with internet art and is represented in on-line collections, including C-theory Multimedia, the Java Museum and the Machida City Museum of Graphic Arts. His most recent research involves experimental interfaces for presenting interactive art in public spaces.

Footnotes:

[1] A number of authors in Wissler, Haseman, Wallace & Keane, 2004 document the new wave of creative industries PhD research awards in Australia from around the turn of the century. See, in particular: Charles Green, p 2 and Kroll, pp 41-44.

[2] Heidegger 1977 also wrote on this topic in his essay "The Age of the World Picture."

[3] For example: Hassel and Partners, (1977), *River Torrens co-ordinated development scheme*, Stages 1&2, Reports.

[4] In this regard major influences have included: Lévy, P. (1998), *Becoming Virtual- Reality in the Digital Age*, Bononno, R., (Tr.), Plenum Press; Derrida, J. (1993), "Artifactualities" in Derrida, J., & Stiegler, B. (2002), *Echographies of Television. Filmed Interviews*, Bajorek, J., (Tr.) Polity Press; and, Althusser, L. (1969), 'Ideology and the State', pp: 121–173 in *Lenin and Philosophy and other essays*, Ben Brewster, (Tr.), 1971. NLB.
Note that Roy Bhaskar, previously mentioned in the text, was not an influence in this regard. Indeed, whilst the ideas that constitute what is known as 'Critical Realism' advance the project to transcend the art-science duality, his account of the domains of the *Real*, the *Actual* and *the Empirical/Conceptual*, may be confused with the terms established in Lévy's "ontological quadrivium" which, I believe, account for virtuality in a way Bhaskar does not. Lévy's ontology is very important for understanding intentionality in computer mediation.