Beyond cyborg subjectivities: becoming-posthumanist educational researchers

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Abstract

This excerpt from our collective biography emerges from a dialogue that commenced when Noel interjected the concept of 'becoming-cyborg' into our conversations about Annette's experiences of breast cancer, which initially prompted her to (re)interpret her experiences as a 'chaos narrative' of cyborgian and environmental embodiment in education contexts. The materialisation of Donna Haraway's figuration of the cyborg in Annette's changing body enabled new appreciations of its interpretive power, and functioned in some ways as a successor project to Noel's earlier deployment of cyborgs in what he now recognises as a 'posthumanising' of curriculum inquiry. Noel's subsequent experiences with throat cancer drew us towards exploring the possibilities that concepts such as Deleuze and Guattari's *machinic assemblage* and Karen Barad's *ontoepistemology* offer as a mean of thinking the meetings of bodies and technologies in educational inquiry beyond Haraway's hybrid cyborg. Through both collective biography and playfully scripted conversations with other theorists we explore what it means to perform diffractive interpretations and analyses in posthumanist educational inquiry. Our essay also contributes to contemporary conversations about the uses of collaborative biographical writing as a method of inquiry in educational research.

Key words: collective biography; cyborg subjectivity; environmental education; posthumanist educational inquiry

Preamble

What does it mean to be 'becoming-posthumanist educational researchers'? One response to this question is the following excerpt from our 'collective biography' (Wyatt et al, 2010, 2011), which we construct through 'playfully' scripted conversations among ourselves and other theorists who inform our research. However, we must immediately point out that by asking, 'what does it mean?' we have no intention of merely supplying a transliteration of 'becoming-posthumanist educational researchers' into yet another set of words. Rather, we hold to Deleuze and Guattari's (1987, p. 257) position that bodies have no interior truth or meaning, but exist only through their external connections and affects: 'We know nothing about a body until we know what it can do, in other words, what its affects are, how they can or cannot enter into composition with other affects, with the affects of another body'. Thus, our 'what does it mean?' question should be understood as 'what do we, as becoming-posthumanist educational researchers *do? How do we *work* and how have we entered into composition with other bodies (including those of our peers and various bodies of knowledge?' Similarly, like Hillevi Lenz Taguchi (2012, p. 268), we seek 'to explore what it might mean to do research where discourse and matter are understood to be mutually constituted in the production of knowing in a flow of continuous differentiation', but again we

attempt to convey what this 'means' to us by demonstrating how we work and what we *produce* by deploying modes of interpretation and analysis informed initially by Donna Haraway's (1994, p. 63) figuration[1] of 'diffraction', which Karen Barad (2014, p. 168) more recently characterises as 'an iterative (re)configuring of patterns of differentiating-entangling'. This excerpt also chronicles a journey that takes many lines of flight[2] as our personal lives interplay with our academic pursuits.

The journey begins and develops in a multiplicity of situations and research orientations, including Haraway's figurations of cyborgs and diffraction; science fiction and poststructuralist textual practices in educational inquiry; the body of the researcher and cancer; narrative and illness; feminism, technologies of self and embodiment; and our own contributions to more mainstream areas of education scholarship including curriculum studies, science and environmental education, and education research methodologies. Embedded within this is a shift from the singularities of self perpetuated by neoliberal individualism towards multiplicities as a productive relationship and a concern with moving beyond epistemological questions such as 'who can be a 'knower', what can be known, what constitutes and validates knowledge, and what the relationship is or should be between knowing and being (that is between epistemology and ontology)' (Liz Stanley & Sue Wise, 1990, p. 26) and exploring the inter-/intra-lacing of epistemology and ontology that Barad (2007, p. 409) refers to as 'ontoepistemology'.

We perform this excerpt from our collective biography as a playfully scripted conversation (a conversation scripted in the manner of a play) for a number of reasons. Firstly, over many years, we have often been drawn to similar objects of educational inquiry and, as a cohabiting couple, have found thinking~talking[3] together to be generative, although what we value in sharing our thinking~talking is not so much what brings us together but what sends us out-ontowards questioning understandings and representations of reality and humanity. Secondly, in recent years we have been inspired by Ken Gale and Jonathan Wyatt's (2008, 2009) performances of what they call 'nomadic inquiry into collaborative writing' and especially by their further collaborations with Susanne Gannon and Bronwyn Davies (Wyatt et. al. 2010, 2011) in which Deleuze (via quotations from his works) is included as a fifth voice in their scripted conversation. Wyatt et al.'s (2010, p. 730) rationale for fashioning a play from their work on the topic of Deleuze and collaborative writing is that 'this mode of writing and speaking would best capture the embodied and performative dimensions of [their] project'. We found their approach to be generative in our own inquiries and have adapted their technique by including the voices of the many other scholars with whose work we have engaged productively.

Much of what follows attempts to recreate the conversation of a couple thinking~talking, and is therefore written in the first person singular; we use the conventions of scriptwriting to signal which one of us is 'I' in particular sections.

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[1] Braidotti (2000, p. 170) argues that 'the notion of "figurations" – in contrast to the representational function of "metaphors" – emerges as crucial to Deleuze's notion of a conceptually charged use of the imagination'. Similarly, Haraway (1997, p. 11) asserts that 'figurations are performative images that can be inhabited … condensed maps of contestable worlds … [and] bumps that make us swerve from literal-mindedness'.

[2] The concept of lines of flight is one among several created by Gilles Deleuze & Félix Guattari (1987, pp. 3-25) – others include 'assemblage', 'territorialisation/deterritorialisation' and 'rhizome' – for analysing thinking as flows or movements across space.

[3] We use the ~ (tilde) to signal a conjoining of co-implicated notions in what we think of as complicity i.e. thinking that is complicit with talking and simultaneously *vice-versa*.

(Auto)biographical methods: potentials and problematics

Noel: I began teaching graduate studies in curriculum a year after William Pinar (1975b) published an influential collection of essays that sought to codify the so-called 'reconceptualization' of curriculum studies, and his autobiographical method of curriculum inquiry – for which he coined the term *currere* (Pinar, 1975a), the Latin root of 'curriculum' in its infinitive form – became a significant component of my teaching and research repertoires for many years. My experiences of both performing *currere* (N. Gough, 1991) and using it to teach curriculum inquiry convinced me that Madeleine Grumet's (1981) claims for this method were not far-fetched – that it has the capacity to reveal how our collective and individual histories and hopes permeate our stories of educational experiences and to question how our interpretations of them influence curriculum thought and action. She also draws attention to the ways in which an individual's attitudes, choices and values might be rendered invisible in our stories.

Madeleine Grumet: 'The problem of studying the curriculum is that we are the curriculum. It is we who have raised our hands before speaking, who have learned to hear only one voice at a time, and to look past the backs of the heads of our peers to the eyes of the adult in authority. It is we who have learned to offer answers rather than questions, not to make people feel uncomfortable, to tailor enquiry to bells, buzzers and nods' (1981, p. 122).

Noel: Although autobiography provided me (and many of my students) with an accessible and flexible frame for critically analysing educational experiences, I often found myself doubting the method's capacity to address Grumet's 'we are the curriculum' problem. Pinar and Grumet clearly sought to rescue autobiography from the self-absorption that fuels many positivist researchers' distrust and dismissal of subjectivity, but I suspected that some students used autobiography to reinforce a unitary sense of an essential humanist self rather than seek a critical perspective on educational experiences they might otherwise have taken for granted. It was not until I worked through the implications of poststructuralist understandings of subjectivity for *currere* that I saw how I might ameliorate this difficulty. My conceptual breakthrough was to recognise the contradiction inherent in the title of Pinar and Reynolds' (1992) edited collection, *Understanding Curriculum as Phenomenological and Deconstructed Text*, namely, that poststructuralist understandings of subjectivity as multiple and continually contested irreversibly destabilise the phenomenological quest for essential meanings (see N. Gough, 1994). A further breakthrough came via my accidental encounters with Haraway's work.

Annette: I had found Bronwyn Davies' (1994) earlier work to be generative in my research in the early 1990s, so I was interested in her more recent writings, particularly around collective biography and the way it can function as 'a research strategy that works with memory, and the virtual body that memory invokes' (Wyatt et al, 2011, p. 7). This seems to be a long way from self-absorption and a much more useful way of working in this space that is consistent with our poststructuralist and posthumanist orientations.

Wyatt et al: 'Collective biography, as a set of research practices, engages in a movement away from individualized, liberal-humanist versions of the subject, towards a poststructuralist conception of the subject – a subject-n-relation, in-process' (2011, p. 8).

Annette and Noel: This conversation therefore exemplifies our efforts to perform, and explore the consequences of, research practices that deliberately subvert the 'individualized, liberal-humanist versions of the subject' encountered in (auto)biographical educational inquiries informed by phenomenology.

Enter cyborgs

Annette: My initial educational research orientation was towards socially critical approaches (see Annette Greenall Gough & Ian Robottom, 1993) rather than the phenomenological/existential positions I associated with *currere*, but in the late 1980s I became immersed in feminist theory, poststructuralism and Michel Foucault's work as part of my doctoral research. Here I found Haraway's (1985, 1989, 1991) troubling of nature/culture dualisms important in undertaking a feminist poststructuralist analysis of the 'foundations' of environmental education (A. Gough, 1994), but I had no interest in the connections she made with particular science fiction works. Her work on partiality, objectivity and situated knowledges, and her critiques of Western science, were very relevant to my research and I shared these with Noel who worked with them in different ways. Although I then rejected Haraway's (1991, p.181) conclusion to her cyborg manifesto that she 'would rather be a cyborg than a goddess' (I wanted to be neither), it was to her figuration of the cyborg[4] that I returned nearly a decade later, with particular reference to 'building and destroying machines, identities, categories, relationships, spaces, stories' (1991, p.181).

Noel*:* I have described elsewhere (N. Gough, 1991) how a succession of accidents led to particular SF[5] stories influencing my personal and academic development, and how SF became significant in my work as a teacher educator and curriculum scholar. In the early 1990s two further accidents of experience provided the motive and opportunity for me to explore more ways of learning with SF and enacting autobiographical curriculum inquiry. In 1991 I was invited to write a research monograph, *Laboratories in Fiction: Science Education and Popular Media* (N. Gough, 1993) as part of the study materials for a new science and technology education course offered by Deakin University. This monograph set out my vision for what I then called a postmodern science education.

In the course of my research for *Laboratories in Fiction* I 'raided' Annette's feminist science studies literature, and was intrigued by their relevance to my explorations of potentially generative links between SF, *currere*, and other methodologies for curriculum inquiry. I was especially inspired by Haraway's cyborg manifesto (1985) and her deployment of SF in *Primate Visions* (1989) Her argument that 'the boundary between science fiction and social reality is an optical illusion' (Haraway, 1985, p. 66) was pivotal to developing the strategy I describe as an alternative to *currere* in 'Manifesting cyborgs in curriculum inquiry' (N. Gough, 1995),

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[4] Haraway (1991, p.149) writes: 'A cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction…. The cyborg is a matter of fiction and lived experience that changes what counts as women's experience in the late twentieth century'.

[5] Haraway (1989, p. 5) explains that SF designates 'a complex emerging narrative field in which the boundaries between science fiction (conventionally, sf) and fantasy became highly permeable in confusing ways, commercially and linguistically'; SF also signifies 'an increasingly heterodox array of writing, reading, and marketing practices indicated by a proliferation of "sf" phrases: speculative fiction, science fiction, science fantasy, speculative futures, speculative fabulation'.

namely, to *diffract*[6] stories of personal experience by reading them within and against speculative fictions, and then to rewrite these stories (and/or write new stories) in ways that self-consciously display their intertextuality (N. Gough, 1998). Although Haraway's (1997, p. 16) concept of diffraction as 'an invented category of semantics', has been reinvigorated recently by feminist and posthumanist scholars (see, e.g., Karen Barad, 2014; Birgit Mara Kaiser & Kathrin Thiele, 2014; Lenz Taguchi, 2012) I did not consciously acknowledge the posthumanist dimensions of my work until Weaver (1999) drew attention to them.

John Weaver: 'Gough's work is no idle exercise in the techno-worship of cyberspace. Instead, he (re)makes the future of curriculum theory and information technology as he critically enters into a dialogue with the post-human condition and the manifestation of this condition in popular culture texts. In this dialogue Gough not only theorizes the impact of information technology on our identity, environment, and curriculum but also establishes a post-structural, postmodern practice in order to understand the impact on students, teachers, and the world of genetic cloning, cosmetic surgery, prostheses, synthesized drugs, memory altering devices, bio-hazardous conditions, and post-Fordist economics' (1999, p. 162).

Becoming-posthuman part 1

Annette: In 2001 I was diagnosed with a rare form of breast cancer and underwent a mastectomy and breast reconstruction. Our mutual interest in Haraway's work led us, in one of our thinking~talking moments, to interpret my experience and changing subjectivity in posthuman terms – Noel observed that I was 'becoming-cyborg' and we domesticated my breast implant by naming it 'cyberboob'. The materialisation of Haraway's figuration of the cyborg in one part of my changing body enabled new appreciations of its interpretive power but, as John Weaver observed, I remained reluctant to identify my whole self as 'cyborg'.

John Weaver*:* 'Annette… is a reluctant posthuman theorist. Although [she] has been writing about posthuman issues for the past 15 years it is her own personal medical struggles that highlight her important contribution to this conversation. [Her] conversation with the posthuman is not only theoretical, it is also a material reality and as personal as anyone can get' (2010, p. 31).

Annette*:* Notice of a forthcoming conference, *Body Modification: Changing Bodies, Changing Selves*, to be held in April 2003, provided further impetus to our respective academic interests in the posthuman as we each prepared paper proposals. My proposal, 'Embodying a mine site: enacting cyborg methodology', foreshadowed my (re)interpretation of my experiences of breast cancer as a 'chaos narrative' of cyborgian and environmental embodiment in which I troubled the relationship between the body, medical technology, and the environments that (re)shape one's identity, which John Weaver interpreted as 'entering the posthuman'.

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[6]   Following Haraway (1994, p. 63) I find diffraction a more generative optical metaphor than reflection: 'My favorite optical metaphor is diffraction – the noninnocent, complexly erotic practice of making a difference in the world, rather than displacing the same elsewhere'.

John Weaver*: '*Annette Gough's personal accounting of reshaping her body and identity as she becomes posthuman demonstrates a new path for curriculum studies scholars and autobiography. Traditionally, autobiography is seen as the writing of the self, but as we see it is also the grafting, Graphein, of the self biologically. It is grafting of the self as it is reconstituted through a medical procedure that joins/sutures/connects this self to a machine, a prosthetic, or scientifically altered biological form. Each person who crosses the modern boundaries of human and machine and enters into the artificially natural realm of the posthuman has their own journey story to tell' (2010, p. 31).

Annette: My *Body Modification* conference paper – a version of which (A. Gough, 2003) was what caught Weaver's (2010) attention – was a significant step towards reclaiming ownership of my body, but more significantly it enabled me to respond to Sarah Squire's (2002, p. 55) question: 'what is the place of personal experience in contemporary feminist writing on the body?' and to Arthur Frank's (1995, p. 53) characterisation of illness as 'a call for stories'.

Arthur Frank: 'Becoming seriously ill is a call for stories in at least two senses. The first is:… Stories have to *repair* the damage that illness has done to the ill person's sense of where she is in life, and where she may be going. Stories are a way of redrawing maps and finding new destinations. The second and complementary call for stories is literal and immediate: the phone rings and people want to know what is happening to the ill person. Stories of the illness have to be told to medical workers, health bureaucrats, employers and work associates, family and friends. Whether ill people want to tell stories or not, illness calls for stories'. (Frank, 1995, pp. 53-4)

Annette: My response was to write several essays (A. Gough, 2003, 2004, 2005) in which I experimented with various 'styles of writing which make the writing of the theorist body possible' (Squire, 2002, p.58) and explored 'how the body of the theorist is presented within theoretical spaces' (Squire, 2002, p.55).

By writing the body of the researcher into educational research through different theoretical framings I found myself 'exploring the possibilities of theorizing within stories instead of about them' (Arthur P. Bochner, 2001, p. 141). In my previous writing I had recognised the importance of being able 'to move back and forth among the various contestatory discourses of neo-Marxisms, feminisms, "minoritarianisms" and poststructuralisms in order to interrupt one another' (Patti Lather, 1991, p. 38). Invoking cyborg methodology in this new writing provided a space to do more than just move between and interrupt discourses – it blurred boundaries to the extent that it might now be called diffractive analysis (Lenz Taguchi, 2012).

Hillevi Lenz Taguchi*: '*Diffractive analysis… relies on the researcher's ability to make matter intelligible in new ways and to imagine other possible realities presented in the data: a real *beyond* those produced by processes of recognition and identification in reflexive interpretations or discursive perspectives or positionings.' (Lenz Taguchi, 2012, p. 267, emphasis in original)

Noel: My proposal for the *Body Modification* conference, 'Becoming-cyborg: performing posthuman pedagogies', was the first time I consciously used the term 'posthuman' in an academic context. At the time I began to research this paper, my approach to writing educational inquiry was increasingly being shaped by a methodological disposition to

produce texts of the kind that Laurel Richardson (2001) calls 'writing-stories' and that I came to call 'narrative experiments' (N. Gough, 2008).

Laurel Richardson: *'Writing is a method of discovery*, a way of finding out about yourself and your world. When we view writing as a *method*, we experience "language-in-use," how we "word the world" into existence … And then we "reword" the world, erase the computer screen, check the thesaurus, move a paragraph, again and again. This "worded world" never accurately, precisely, completely captures the studied world, yet we persist in trying. Writing as a method of inquiry honors and encourages the trying, recognizing it as emblematic of the significance of language' (2001, p. 35, emphases in original).

Noel*:* Like Richardson (2001, p. 35), I found myself writing in order *'*to find something out… to learn something that I did not know before I wrote it'[7], and found it increasingly generative to bring objects of inquiry into intertextual play with Deleuze and Guattari's geophilosophy and 'fictions' in the broadest sense of the term.

The narrative experiment that emerged as my 'Becoming-cyborg' paper was inspired by Deleuze and Guattari's (1987) figuration of the rhizome – a process that I now characterise as *rhizosemiotic play* (N. Gough, 2007). In my 'report' of this experiment (N. Gough, 2004) I approach the task of writing cyborgs from Deleuze and Guattari's (1994, pp. 35-36) standpoint – that doing philosophy means creating concepts (rather than clarifying them, in the manner of traditional analytic philosophy) – and in the spirit of Deleuze's (1994, p. xx) assertion that a work of philosophy 'should be… in part a kind of science fiction'[8]. My experiment with the concept of 'rhizomANTically becoming-cyborg' examines the different ways of exploring human/machine relationships offered by intertextual readings of Deleuze and Guattari's rhizomatics, Haraway's cyborg, the uses of actor-network theory (ANT) to investigate the results of 'mixing humans and nonhumans together' (Bruno Latour, 1988, p. 298)*,* and a particular SF text, Jerry Prosser and Rick Geary's (1992) graphic novel, *Cyberantics*.

Becoming-posthuman part 2

John Weaver*:* 'The posthuman experience is also the rewriting or re-building of the self after a medical procedure. Whether these procedures are performed in order to save a life…or done in the name of vanity, the body is still re-shaped and the self as a result is also re-formulated.' (2010, p. 31)

Annette and Noel: Weaver's (2010, p. 31) description of the posthuman experience is precisely what happened to us when Noel's body was reshaped, and both of our selves were thereby re-formulated, in late 2012. While on vacation in France, Noel suffered a

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[7] My narrative experiments are *essays*, understood both as a verb – to attempt, to try, to test – and as a noun. In theoretical inquiry an essay serves similar purposes to an experiment in empirical research – a methodical way of investigating a question or problem. Both 'essay' and the related term 'assay' come to English through the French *essayer* from the Latin *exigere*, to weigh. I write essays to test ideas, to 'weigh' them up, to give me (and I hope others) a sense of their worth.

[8] The sense in which Deleuze (1994) uses 'science fiction' here converges with Richardson's (2001) notion of writing 'to find something out'. Deleuze (1994, p. xxi) elaborates: 'We write only at the frontiers of our knowledge, at the border which separates our knowledge from our ignorance and transforms the one into the other'

massive haemorrhage in his throat and was diagnosed with a large squamous cell carcinoma at the base of his tongue. The first attempt to stabilise him for safe repatriation to Australia failed. After a second massive haemorrhage he was intubated and placed in an induced coma for 36 hours. Three arteries in his neck were sealed with metal clips. For most of the period of his hospitalisation he was receiving intravenous blood transfusions and medications. In our respective roles as subject of, and witness to, these invasive procedures our identities were rebuilt.

John Weaver: 'When someone is grafted to a machine, as a kidney patient or an organ recipient is, their self is re-written and re-shaped by the introduction of a machine into their lives. It is a humbling experience to wake up from a medical procedure and to realize that as a patient you are still alive because inorganic material has been placed into your body or connected to the outside of your body. In a strange ironic twist, the body needs to be re-shaped and the self re-written before the initial writing can begin. In the posthuman condition the *graphy* comes before the *auto* and the *bio* not only refers to the self but to the biological material form of the individual.' (2010, p. 32, our italics)

Annette: John Weaver's observations about the posthuman condition certainly match my experiences. Although I had written my way through my own cancer experiences a decade earlier, our experiences in France highlighted the relevance of Karen Barad's (2007, p. 185) concept of *ontoepistemology* ('the interrelated practices of knowing *in* being') and her notion of material-discursive *intra-activity*, which refers to relationships between multiple bodies (both human and non-human) that are always affecting or being affected by each other in an interdependent and mutual relationship as a condition for their existence (2007, p.152). It would have been useful to have these concepts to play with when I was producing my earlier writing, because it would have given me a new language with which to analyse the activity of one body making itself intelligible to another. We anticipate that these concepts will continue to be generative as we continue our diffractive analyses of becoming-posthumanist educational researchers.

French connections

Annette: We did not anticipate Noel becoming more posthuman in France during our 2012 vacation, but our location in France converged with our academic predispositions to engage French philosophers. Since the early 1990s I have found Foucault's work relevant for feminist poststructuralist analysis because I agree with Chris Weedon (1987, p. 125) that his emphasis on power relations in discourses offers feminists 'a contextualization of experience and an analysis of its constitution and ideological power'. For Foucault, discourses 'are ways of constituting knowledge, together with the social practices, forms of subjectivity and power relations which inhere in such knowledges and the relations between them' (quoted in Weedon 1987, p.108).

I interpreted my experiences of the discourses of power relations impacting on my body as 'embodying a mine site' (A. Gough, 2003), and my writings were a performance of power structuring relations between subjects: 'Power is exercised within discourses in the ways in which they constitute and govern individual subjects... Power also structures relations between different subjects within or across discourses' (Weedon, 1987, p.113-114). Eventually, these experiences also empowered me to recognise these power relations and experiment with going beyond them, with particular reference to Foucault's (1975/1991, 1981) work on surveillance and power.

Michel Foucault: 'Discourse transmits and produces power; it reinforces it but it also undermines and exposes it, renders it fragile and makes it possible to thwart it' (1976/1981, p.101) [where power is understood as] 'the multiplicity of force relations immanent in the sphere in which they operate and which constitute their own organization' (1976/1981, p.92).

Annette: Building on my understandings of Foucault (1975/1991, 1976/1981) and taking up Braidotti's (2002, p. 245) challenge 'to combine the recognition of postmodern embodied subjects with resistance to power but also the rejection of relativism and cynicism' provided the theoretical scaffolding that enabled me to begin writing my body, and to think through 'the place of the personal within theory' (Squire, 2002, p.56). By focusing on the construction of my body as an embodied mine site, I conceptualised my self as 'a mode of holding together the epistemological and the ontological' (Elspeth Probyn, 1993, p. 4). For me, empowerment came from being able to locate myself in the practice of theorisation: 'Theory is not merely an abstraction, but is lived at the level of the experiential itself' (Squire, 2002, p.56).

Noel: In recent years, the French philosophers who have engaged me most productively are Deleuze and Guattari (N. Gough, 2006, 2007; Warren Sellers & Noel Gough, 2010). However, these explorations focus chiefly on implications for educational research methodology and academic writing practices, rather than on theorising encounters between human bodies and other objects.

During the period in which I was intermingled with biomedical technologies, I did not readily see myself as a cyborg, because I was aware that the machines determining what I was becoming were not primarily prosthetic. For example, the linear accelerator that daily bombarded the tumour in my throat with high velocity subatomic particles was not an addition or attachment to my body. As Dianne Currier (2003, pp. 323-324) suggests, this might signal a limitation on the conceptual generativity of the cyborg.

Dianne Currier: 'in so far as the hybrid cyborg is forged in the intermeshing of technology with a body, in a process of addition, it leaves largely intact those two categories – (human) body and technology – that preceded the conjunction… in the prosthetic underpinnings of the cyborg the transformational potential of the intersections of bodies and technologies is curtailed… to seek transformative possibilities we require a new means of thinking both bodies and technologies and the conditions of their intersections' (2003, pp. 323-324).

Noel: Currier follows Elizabeth Grosz (1994) in suggesting that Deleuze and Guattari's concept of *assemblage* offers a means of thinking bodies other than through oppositional categories, which necessarily reframes our understandings of the encounters between bodies and other objects.

Elizabeth Grosz: '[*assemblage* offers] an altogether different way of understanding the body in its connections with other bodies, both human and non-human, animate and inanimate, linking organs and biological processes to material objects and social practices while refusing to subordinate the body to a unit of a homogeneity of the kind provided by the body's subordination to consciousness or to biological organizations' (1994, p. 165).

Noel*:* Deleuze and Guattari (1987, p. 20) assert that 'all we know are assemblages. And the only assemblages are machinic assemblages of desire and collective assemblages of enunciation'. Their concept of machinic assemblages, rather than organisms or mechanisms, subverts the idea that wholes pre-exist connections. All human bodies are, at the very least, assemblages of genetic material, ideas, powers of acting and relations to other bodies. These connections multiply and complexify in a body undergoing treatment for cancer, not just in terms of new material connections with machines and drugs, but also new social relationships with, for example, radiation oncologists, technicians and nurses, and changed interpersonal relationships with family and friends. My personal experiences of such treatment enriched my theoretical understandings of my posthuman self as a 'machinic assemblage'. Peta Malins (2004) elaborates usefully on the concept of the body as machinic assemblage.

Peta Malins: 'The body conceived of as a machinic assemblage becomes a body that is multiple. Its function or meaning no longer depends on an interior truth or identity, but on the particular assemblages it forms with other bodies…a body should, ultimately, be valued for what it can do (rather than what it essentially "is"), and that assemblages should be assessed in relation to their enabling, or blocking, of a body's potential to become other.' (2004, p. 84)[9]

Noel*:* As a cancer patient undergoing radiation treatment and chemotherapy I became aware that I could not conceive of my body in terms of the modernist fiction of the human body as a stable, unified, bounded entity. Rather, my body's function and potential to become other than terminally ill was now entirely dependent on which other bodies or machines with which it could form an assemblage.

Becoming-posthuman educational researchers: next steps

Annette and Noel*:* Post-cancer, we both renewed our interest in exploring the implications of posthumanist perspectives in environmental education research. With some honourable (but relatively scarce) exceptions, much environmental education research privileges an anthropocentric gaze, which assumes autonomous human subjects as starting points for knowledge production and the focus of attention for data production and analysis. This is consistent with Braidotti's (2013) recent writing in which she notes that 'discourses and representations of the non-human, the inhuman, the anti-human, the inhumane and the posthuman proliferate and overlap in our globalized, technologically mediated societies' (p. 2) and argues for a 'post-anthropocentric posthumanism' that focuses 'entirely on the normatively neutral relational structures of both subject formation and of possible ethical relations' (p. 92). One area of prospective interest for both of us is to revisit our previous efforts to encourage more queer scholarship in environmental education (N. Gough & A. Gough, 2003) which we regret appeared largely to fall on deaf ears. We anticipate that Barad's (2008) evocation of materialist understandings of 'queer causation' and 'queer performativity' (Barad, 2011) will be generative resources for such efforts.

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[9]   Malins' article focusses specifically on the implications of this conception of the body for understanding and responding to drug users. Ian Buchanan (1997) and Nick Fox (2012) provide further elabora(tions '.of this theoretical position. Annie Potts (2002, 2004) provides detailed demonstrations of the value of a Deleuzian approach to the socio-cultural impact of the medicalization of sexuality and the use of pharmaceuticals for the treatment of so-called 'sexual dysfunctions'.

Noel: I am currently curious to explore the possibilities for 'undoing anthropocentrism' (N. Gough, 2015) by conceiving ourselves and the subjects/objects of our inquiries as machinic assemblages. That is, our posthuman relationships with environments writ large are not about individual subjects autonomously forming and developing relations with the world but, rather, about realising that these relations always already exist, and might be as much influenced by the behaviour of other materials in the places we inhabit as they are by our intentional or unintentional actions. Such considerations support what Karin Hultman and Hillevi Lenz Taguchi (2010) call a *relational materialist* methodology which, in the context of environmental education research, would involve creating concepts for understanding learners as emergent in relational fields in which non-human materials are inevitably at play in constituting their becomings and to deploy tools such as diffractive analysis (Lenz Taguchi (2012, p. 267) to make such non-human materials intelligible. This approach is also consistent with the feminist poststructuralist materialism exemplified by Barad's (2003) elaboration of 'posthumanist performativity'.

Such an approach is further inflected by what Katherine Hayles (2012, p. 24) terms *technogenesis*, 'the idea that human and technics have coevolved together'. Hayles[10] focuses on digital technologies, arguing that an individual's interactions with digital media are not only cognitive but also 'have bodily effects on the physical level' (p. 15). Hayles's (2012) inquiries concern how we read, distinguishing between close reading, requiring deep attention, and fast or hyper reading that relies on sporadic sampling. Hayles argues that these different types of cognition are embodied 'conscious, unconscious, and nonconscious processes' (p. 68) and cites recent neurological studies that demonstrate measurable differences between the brain functions of someone close-reading and performing a Google search (pp.76-8).

The embodied neural plasticity that links digital media with various types of reading and attention exemplifies a mechanism of technogenesis whereby 'epigenetic changes in human biology can be accelerated by changes in the environment that make them even more adaptive, which leads to further epigenetic changes' (Hayles, 2012, p. 24). Although the idea of an interrelationship between human evolution and human-produced technologies is not new, Hayles's concept of a technogenesis driven by digital media is more complex than neo-Darwinian understandings that view the environment as largely static, with organisms changing to accommodate to it across lengthy periods of time. Rather, both humans and digital technologies change across much shorter time scales due to neural plasticity at various levels. Hayles (2012) refutes the claims of digital media sceptics that hyperlinked reading causes the degradation of comprehension.

Katherine Hayles: '[the] condescending view of media… forecloses an important resource for contemporary self-fashioning, for using [neural] plasticity both to subvert and redirect the dominant order.' (2012, p. 97) 'It is far too simplistic to say that hyper attention represents a cognitive deficit or a decline in cognitive ability among young people… On the contrary, hyper attention can be seen as a positive adaptation that makes young people better suited to live in information-intensive environments.' (2012, p. 112)

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[10] I should acknowledge that my long engagement with Katherine Hayles' work owes much to my appreciation of her enthusiasm for incorporating SF texts into her scholarly research on posthumanism and other subject matters at the intersections of literature and science (see, e.g.,N. Katherine Hayles, 1993, 1997, 1999, 2003)

Noel: Hayles prompts me to consider the implications of how we read for environmental education research. The concepts of close and hyper reading do not only apply to print and electronic media but also to our 'reading' of landscapes and activities located in them. Walking in a rainforest can be as 'information-intensive' as searching the Internet but I know of no studies of the brain functions of people reading and attending to such environments in different ways that might be the equivalents of neurological and cognitive studies of close and hyper reading. I can envisage considerable conceptual, methodological and technical difficulties in conducting such research, but the underlying question of how a propensity for hyper reading affects environmental interpretation seems nevertheless worthy of exploration.

Annette: More recently, prompted by Weaver (2010), I have returned to posthuman educational inquiry via Jean-Luc Nancy's (2007) writings around globalisation and exploring their relationship to embodied research in environmental education. In particular I have been exploring beyond traditional autobiography as the writing of the self to a grafting of the self that is reconstituted through medical procedures (A. Gough, 2015). My exploration is guided by Foucault's (1984) genealogy, situated within the articulation of the body and history.

Michel Foucault: 'The body is the inscribed surface of events (traced by language and dissolved by ideas), the locus of a dissected self (adopting the illusion of substantial unity), and a volume in perpetual disintegration,' [and the task of genealogy is to expose both] 'a body totally imprinted by history and the process of history's destruction of the body.' (1984, p.83)

Annette: My recent writing incorporates theoretical and policy framings that have emerged in the decade since I started writing my cyborg curriculum stories. This recognises that the total replacement of my left knee in 2012 has me even more closely grafted to a machine, as well as highlighting that my body is, as Foucault said, 'a volume in perpetual disintegration'. It also stimulates discussions about the writing of the body of the researcher into educational research by theorising poverty and aging in a world that is increasingly becoming not for everyone, as Weaver (2010, p. 5) notes in reference to Nancy's (2002/2007) *glomus*.

John Weaver: 'The glomus is the privileging of the artificial body over the natural body. The artificial body represents accumulation of wealth, access to state of the art medicine, and disposable income to stave off aging, live longer, and avoid genetically influenced diseases'. (2010, p. 5)

Annette: My knee replacement also drew attention to how 'The subject's experience of the body is irreducibly bound up with the body's social status' (Grosz, 1995, pp. 194-195). That I could have my knee replaced when I wanted, where I wanted and by my preferred surgeon was only because I have the 'disposable income to stave off aging'. My mobility is a significant issue for me, but in many ways it is a 'first world problem' compared with the major threats to survival, and other inequalities, of many people elsewhere in the world. Instead of an embodied mine site post breast cancer surgery, I now feel that I embody the products of that mine site (given the content of the materials in the replacement knee) and that I am more aware of my relative wealth and privilege in being able to have a prosthetic knee. Nancy's (2002/2007) writing on globalisation is particularly relevant to both becoming-posthumanist and environmental education

research, and his argument for *mondialisation* to resist the agglomeration that has invaded previous conceptions of the world and made it a *glome*, we need to make a decision to reinvent or (re)create the world while recognising that we will always be in transition. It is these aspects that relate to Nancy's glomus and globalisation in relation to environmental education that I will continue to explore.

Annette and Noel: We have also been writing together (A. Gough & N. Gough, 2015), using diffractive analysis and Foucault's (1984, p. 83) notion of genealogy, to expose how the body of environmental education is imprinted by history and the process of history's destruction of the body of environmental education. We have drawn on Nancy's (2007) writings about denaturation and ecotechnologies to draw attention to the changing ways 'environment' has been represented in the discourses of environmental education.

Our writings on becoming-posthumanist educational researchers, individually and collectively, are manifestly contributing to academic knowledge production and challenging others to think and act differently – as evidenced most obviously by John Weaver (2010) whose voice we include in this conversation at several points. More recently, in a review of Nathan Snaza and John Weaver's (2015) edited volume, *Posthumanism and Educational Research*, to which we both contributed chapters, Paul William Eaton (2016, p. 472) writes: 'Part 4 of the text draws together three curriculum scholars [Noel Gough, Annette Gough and John Weaver] who have laid the foundation for posthumanist turns in educational inquiry'. Our aim as becoming-posthumanist educational researchers is to build upon that foundation.

As noted in our Preamble, we have attempted to articulate what we understand by 'becoming-posthumanist educational researchers' by offering readers this excerpt from our collective biography presented as a playfully scripted conversation. As with our attempts to encourage more queer scholarship in environmental education (N. Gough & A. Gough, 2003), we see the content and methods we deploy in constructing this essay as an encouragement to colleagues to similarly experiment with widening the horizons of what counts as environmental education research.

As also foreshadowed in our Preamble, we have not produced this text to represent the world but to act in it. As Deleuze and Guattari (1987, p. 11) write with respect to one type of text, 'the book is not an image of the world. It forms a rhizome with the world'. We accept this view, and thus see texts as practices that interact with the world, so that the possibilities of texts and writing correspond to their ability to create new paths and produce new thoughts. We leave it to readers to decide for themselves what *this* text produces in *their* worlds.

Post-script

Returning to our initial question, 'What does it mean to be 'becoming-posthumanist educational researchers?', we see this very much as a work in progress, but also as one that is not without tensions and challenges. One of these comes from what Weaver notes above, that the posthuman artificial body is very much posthumanism for the privileged, so its potential association with neoliberal individualism creates a tension that merits further exploration. Also, although there is power in diffractive analysis producing knowledge that makes us aware of our embodied involvement in an active material-discursive reality, such an analysis commits us 'to understanding how we as researchers are responsibly engaged in shaping the future for humans, non-humans and the material environment in our production of knowledge' (Lenz Tagushi, 2012, p. 278). As Birgit Kaiser and Kathrin Thiele (2014, p.166) note, 'To

develop a critical toolbox in the diffractive mode for our studies of world(ing)s seems to us one of the major tasks for future humanities research' – to which we would add natural and social sciences research. Within our particular field of environmental education research, this means taking up Braidotti's (2013) challenge to work towards 'post-anthropocentric posthumanism', which will not be easy.

References
(NB. In regard to the use of full names in this reference list, we depart from the *Publication Manual of the American Psychological Association* to facilitate reading the gender politics of the sources on which we draw in this conversation. We also believe that it is discourteous to authors to arbitrarily truncate the ways in which they prefer to identify themselves.)

Barad, Karen. (2003). Posthumanist performativity: toward an understanding of how matter comes to matter. *Signs: Journal of Women in Culture and Society, 28*(3), 801-831.

Barad, Karen. (2007). *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham & London: Duke University Press.

Barad, Karen. (2008). Queer causation and the ethics of mattering. In Noreen Giffney & Myra J. Hird (Eds.), *Queering the Non/Human* (pp. 311-338). Aldershot: Ashgate.

Barad, Karen. (2011). Nature's queer performativity. *Qui Parle, 19*(2), 121-158.

Barad, Karen. (2014). Diffracting diffraction: cutting together-apart. *Parallax, 20*(3), 168-187.

Bochner, Arthur P. (2001). Narrative's virtues. *Qualitative Inquiry, 7*(2), 131-157.

Braidotti, Rosi. (2000). Teratologies. In Ian Buchanan & Claire Colebrook (Eds.), *Deleuze and Feminist Theory* (pp. 156-172). Edinburgh: Edinburgh University Press.

Braidotti, Rosi. (2002). *Metamorphoses: Towards a Materialist Theory of Becoming*. Cambridge: Polity Press.

Braidotti, Rosi. (2013). *The Posthuman*. Cambridge MA: Polity Press.

Buchanan, Ian. (1997). The problem of the body in Deleuze and Guattari, or, what can a body do? *Body & Society, 3*(3), 73-91.

Currier, Dianne. (2003). Feminist technological futures. *Feminist Theory, 4*(3), 321-338.

Davies, Bronwyn. (1994). *Poststructuralist Theory and Classroom Practice*. Geelong: Deakin University.

Deleuze, Gilles. (1994). *Difference and Repetition* (Paul Patton, Trans.). New York: Columbia University Press.

Deleuze, Gilles, & Guattari, Félix. (1987). *A Thousand Plateaus: Capitalism and Schizophrenia* (Brian Massumi, Trans.). Minneapolis: University of Minnesota Press.

Deleuze, Gilles, & Guattari, Félix. (1994). *What is Philosophy?* (Graham Burchell & Hugh Tomlinson, Trans.). London: Verso.

Eaton, Paul William. (2016). Review of *Posthumanism and Educational Research* ed. by Nathan Snaza, John Weaver. *The Review of Higher Education, 39*(3), 470-473.

Foucault, Michel. (1975/1991). *Discipline and Punish: The Birth of the Prison* (Alan Sheridan, Trans.). London: Penguin Books.

Foucault, Michel. (1981). *The History of Sexuality, Volume 1: An Introduction* (Robert Hurley, Trans.). London: Pelican Books.

Foucault, Michel. (1984). Nietsche, Genealogy, History. In Paul Rabinow (Ed.), *The Foucault Reader* (pp. 76-100). London: Penguin Books.

Fox, Nick J. (2012). Deleuze and Guattari. In Graham Scambler (Ed.), *Contemporary Theorists for Medical Sociology* (pp. 150-166). London: Routledge.

Frank, Arthur W. (1995). *The Wounded Storyteller: Body, Illness, and Ethics*. Chicago and London: University of Chicago Press.

Gale, Ken, & Wyatt, Jonathan. (2008). Two men talking: a nomadic inquiry into collaborative writing. *International Review of Qualitative Research, 1*(3), 361-380.

Gale, Ken, & Wyatt, Jonathan. (2009). *Between the Two: A Nomadic Inquiry into Collaborative Writing and Subjectivity*. Newcastle-upon-Tyne: Cambridge Scholars.

Gough, Annette. (1994). *Fathoming the fathers in environmental education: a feminist poststructuralist analysis*. (PhD PhD thesis), Deakin University. Retrieved from http://tux.lib.deakin.edu.au/adt-VDU/public/adt-VDU20070330.151753/

Gough, Annette. (2003). Embodying a mine site: enacting cyborg curriculum? *Journal of Curriculum Theorizing, 19*(4), 33-47.

Gough, Annette. (2004). Blurring boundaries: enacting cyborg subjectivity and methodology. In Heather Piper & Ian Stronach (Eds.), *Educational Research: Difference and Diversity* (pp. 113-127). Aldershot: Ashgate.

Gough, Annette. (2005). Body/Mine: a chaos narrative of cyborg subjectivities and liminal experiences. *Women's Studies, 34*(3-4), 249–264.

Gough, Annette. (2015). Resisting becoming a glomus body within posthuman theorizing: *mondialisation* and embodied agency in educational research. In Nathan J. Snaza & John A. Weaver (Eds.), *Posthumanism and Educational Research* (pp. 167-181). New York: Routledge.

Gough, Annette, & Gough, Noel. (2015). The denaturation of environmental education: exploring the role of ecotechnologies. *Australian Journal of Environmental Education*, Available on CJO 2015 doi:2010.1017/aee.2015.2013.

Gough, Noel. (1991). An accidental astronaut: learning with science fiction. In George Willis & William H. Schubert (Eds.), *Reflections from the Heart of Educational Inquiry: Understanding Curriculum and Teaching through the Arts* (pp. 312-320). Albany NY: State University of New York Press.

Gough, Noel. (1993). *Laboratories in Fiction: Science Education and Popular Media*. Geelong: Deakin University.

Gough, Noel. (1994). Imagining an erroneous order: understanding curriculum as phenomenological and deconstructed text. *Journal of Curriculum Studies, 26*(5), 553-568.

Gough, Noel. (1995). Manifesting cyborgs in curriculum inquiry. *Melbourne Studies in Education, 36*(1), 71-83 (Note: the cover pages of this issue incorrectly identify it as vol. 29).

Gough, Noel. (1998). Reflections and diffractions: functions of fiction in curriculum inquiry. In William F. Pinar (Ed.), *Curriculum: Toward New Identities* (pp. 94-127). New York: Garland.

Gough, Noel. (2004). RhizomANTically becoming-cyborg: performing posthuman pedagogies. *Educational Philosophy and Theory, 36*(3), 253-265.

Gough, Noel. (2006). Shaking the tree, making a rhizome: towards a nomadic geophilosophy of science education. *Educational Philosophy and Theory, 38*(5), 625-645.

Gough, Noel. (2007). Changing planes: rhizosemiotic play in transnational curriculum inquiry. *Studies in Philosophy and Education, 26*(3), 279-294.

Gough, Noel. (2008). Narrative experiments and imaginative inquiry. *South African Journal of Education, 28*(3), 335-349.

Gough, Noel. (2015). Undoing anthropocentrism in educational inquiry: a phildickian space odyssey? In Nathan J. Snaza & John A. Weaver (Eds.), *Posthumanism and Educational Research* (pp. 151-166). New York: Routledge.

Gough, Noel, & Gough, Annette. (2003). Tales from Camp Wilde: queer(y)ing environmental education research. *Canadian Journal of Environmental Education, 8*, 44-66.

Greenall Gough, Annette, & Robottom, Ian. (1993). Towards a socially critical environmental education: water quality studies in a coastal school. *Journal of Curriculum Studies, 25*(4), 301-316.

Grosz, Elizabeth. (1994). *Volatile Bodies: Toward a Corporeal Feminism*. St Leonards NSW: Allen & Unwin.

Grosz, Elizabeth. (1995). *Space, Time and Perversion: The Politics of Bodies*. St Leonards NSW: Allen & Unwin.

Grumet, Madeleine R. (1981). Restitution and reconstruction of educational experience: an autobiographical method for curriculum theory. In Martin Lawn & Len Barton (Eds.), *Rethinking Curriculum Studies: A Radical Approach* (pp. 115-130). London: Croom Helm.

Haraway, Donna J. (1985). A manifesto for cyborgs: science, technology and socialist feminism in the 1980s. *Socialist Review, 15*(2), 65-107.

Haraway, Donna J. (1989). *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. New York: Routledge.

Haraway, Donna J. (1991). *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge.

Haraway, Donna J. (1994). A game of cat's cradle: science studies, feminist theory, cultural studies. *Configurations: A Journal of Literature, Science, and Technology, 2*(1), 59-71.

Haraway, Donna J. (1997). *Modest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™ : Feminism and Technoscience*. New York and London: Routledge.

Hayles, N. Katherine. (1993). The life cycle of cyborgs: writing the posthuman. In Marina Benjamin (Ed.), *A Question of Identity: Women, Science, and Literature* (pp. 152-170). New Brunswick NJ: Rutgers University Press.

Hayles, N. Katherine. (1997). The posthuman body: inscription and incorporation in *Galatea 2.2* and *Snow Crash. Configurations: A Journal of Literature, Science, and Technology, 5*(2), 241-266.

Hayles, N. Katherine. (1999). *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. Chicago and London: University of Chicago Press.

Hayles, N. Katherine. (2003). Afterword: the human in the posthuman. *Cultural Critique*(53), 134-137.

Hayles, N. Katherine. (2012). *How We Think: Digital Media and Contemporary Technogenesis*. Chicago: University of Chicago Press.

Hultman, Karin, & Lenz Taguchi, Hillevi. (2010). Challenging anthropocentric analysis of visual data: a relational materialist methodological approach to educational research. *International Journal of Qualitative Studies in Education, 23*(5), 525 - 542.

Kaiser, Birgit Mara, & Thiele, Kathrin. (2014). Diffraction: onto-epistemology, quantum physics and the critical humanities. *Parallax, 20*(3), 165-167.

Lather, Patti. (1991). *Getting Smart: Feminist Research and Pedagogy With/in the Postmodern*. New York: Routledge.

Latour, Bruno. (1988). Mixing humans and nonhumans together: the sociology of a door-closer. *Social Problems, 35*(3), 298-310.

Lenz Taguchi, Hillevi. (2012). A diffractive and Deleuzian approach to analysing interview data. *Feminist Theory, 13*(3), 265-281.

Malins, Peta. (2004). Machinic assemblages: Deleuze, Guattari and an ehico-aesthetics of drug use. *Janus Head, 7*(1), 84-104.

Nancy, Jean-Luc. (2007). *The Creation of the World or Globalization* (Francois Raffoul; David Pettigrew, Trans.). Albany, NY: State University of New York Press.

Pinar, William F. (1975a). *Currere*: towards reconceptualization. In William F. Pinar (Ed.), *Curriculum Theorizing: the Reconceptualists* (pp. 396-414). Berkeley, CA: McCutchan.

Pinar, William F. (Ed.). (1975b). *Curriculum Theorizing: the Reconceptualists*. Berkeley, CA: McCutchan.

Pinar, William F., & Reynolds, William M. (Eds.). (1992). *Understanding Curriculum as Phenomenological and Deconstructed Text*. New York: Teachers College Press.

Potts, Annie. (2002). *The Science/Fiction of Sex: Feminist Deconstruction and the Vocabularies of Heterosex*. London and New York: Routledge.

Potts, Annie. (2004). Deleuze on Viagra (or, what can a 'Viagra-body' do?). *Body & Society, 10*(1), 17-36.

Probyn, Elspeth. (1993). *Sexing the Self: Gendered Positions in Cultural Studies*. London and New York: Routledge.

Prosser, Jerry, & Geary, Rick (Eds.). (1992). *Cyberantics*. New York: Dark Horse Comics.

Richardson, Laurel. (2001). Getting personal: writing-stories. *International Journal of Qualitative Studies in Education, 14*(1), 33-38.

Sellers, Warren, & Gough, Noel. (2010). Sharing outsider thinking: thinking (differently) with Deleuze in educational philosophy and curriculum inquiry. *International Journal of Qualitative Studies in Education, 23*(5), 589-614.

Snaza, Nathan J., & Weaver, John A. (Eds.). (2015). *Posthumanism and Educational Research*. New York: Routledge.

Squire, Sarah. (2002). The personal and the political: writing the theorist's body. *Australian Feminist Studies, 17*(37), 55-64.

Stanley, Liz, & Wise, Sue. (1990). Method, methodology and epistemology in feminist research processes. In Liz Stanley (Ed.), *Feminist Praxis* (pp. 20-60). London/NewYork: Routledge.

Weaver, John A. (1999). Synthetically growing a post-human curriculum: Noel Gough's curriculum as a popular cultural text. *Journal of Curriculum Theorizing, 15*(4), 161-169.

Weaver, John A. (2010). *Educating the Posthuman: Biosciences, Fiction, and Curriculum Studies*. Rotterdam: Sense Publishers.

Weedon, Chris. (1987). *Feminist Practice and Poststructuralist Theory*. Oxford: Blackwell.

Wyatt, Jonathan, Gale, Ken, Gannon, Susanne, & Davies, Bronwyn. (2010). Deleuzian thought and collaborative writing: a play in four acts. *Qualitative Inquiry, 16*(9), 730-741.

Wyatt, Jonathan, Gale, Ken, Gannon, Susanne, & Davies, Bronwyn. (2011). *Deleuze and Collaborative Writing: An Immanent Plane of Composition*. New York: Peter Lang.

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