

Not just talk: Restoring pedagogy in the silent body (0368)

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Abstract

This paper explores the body-work of scientific knowledge-making, suggesting that the signature of science practice is the silence of an externally directed attention relating to the 'real'. In this paper I surmise the virtues of the 'literary turn', but I also indicate the problem of the contemporary appetite for talk, modelling the ways in which the science practices of material realization and perhaps the realizations of craft-work more generally, have the potential to bring quiet because of attending to the body and developing its capacity for sensory awareness. In my presentation I will use theory, drawing on the work of Natasha Myers, Jürgen Habermas, Hans Radder and Hans-Jörg Rheinberger, and case studies of scientific practice, presenting a new synthesis as well as reviewing the work of Michael Lynch, Barbara Whitmann and others in the science studies field. My purpose is a restoration of the body to the higher education scene.

Extended abstract

Introduction

Among the recent achievements of research in higher education, the academic literacies approach (c.f. Lea & Street, 1998) has been particularly significant, leading to important teaching and learning gains in the writing disciplines (e.g. Haggis, 2009). This approach, related to the 'literary turn' in contemporary philosophy, has emphasised self-authorship (e.g. Baxter-Magolda, 2014), voice (e.g. Miano, 2004) and talk (e.g. Alexander, 2004), striking an accord with the zeitgeist of new media and mass communication (Eco, 1984) and now extending to almost every field of education (Gross, 2008). Even science education has adopted 'the literary turn', making scientific literacy a cardinal concern (Greenleaf *et al*, 2011, for example).

Every stick has two ends, however, and it is possible that the virtues of creativity, originality, independence and insight; vital attributes of dialogue (Wegerif, 2007), are nevertheless the corresponding vices of an apparently insatiable appetite for talk. In science studies there is now growing acknowledgement that *non-linguistic action* (materialization: c.f. Radder, 2012) has a well-defined place in practice. In fact the contemporary view of science knowledge-making implicates the corporeal body of the scientist as the most important knowledge-transaction site (Hay *et al*, 2013): The body being a silent repository of material experience of "things" (Rheinberger, 2010) which while 'naturally' inscrutable are gradually coaxed into leaving their own trace (Latour & Woolgar, 1984) in

order to render visible new aspects their 'real world' (material) identities (see, Rheinberger, 1998; Knorr Cetina, 1999; Hay, *et al.*, 2013). This process of material realization and its description happens without words (Myers, 2012); or if words are needed to share 'data' and method with others, then such description always occurs in layman-language (Radder, 2012): *Without* interpretation (*ibid*). It is body-work (sensing and feeling) which constitutes this silent-witness (Myers, 2008) creating the repository of somatic knowledge (Collins, 2010) and as Hans Radder puts it: "*Science is not simply a linguistic practice, as so many modern philosophers of science – who have experienced the 'linguistic turn' in general philosophy – have tried to make us believe*" (Radder, 2012. P. 111).

This paper will examine these contentions, exploring Radder's view of material realization and developing a framework for pedagogy of the silent body. My purpose is to suggest that alongside, but so to speak, running in the opposite direction to the process of verbal labelling (which happens automatically), there is a non-verbal prerogative of physical (sensory and material) awareness which is also needed, certainly for science knowledge-making, but perhaps throughout all academic practice. Drawing on, but also challenging and developing Marton and Booth's "*anatomy of awareness*" (Marton and Booth, 1997), I suggest that attending to this silence can change the quality of experience immiscible to genuine inquiry and I argue that by restoring the body to the higher education scene, science repays the debt of language which it owes towards the Arts and Humanities.

Drawing on Science

Since 2008 the world-wide contest "Dance Your PhD" has emerged as a lively and imaginative way for scientists to *communicate* their work. As Myers (2012) shows, however, the body-work of science is much more fundamental than being just a form of science-talk: Body-work is the silent affective and kinaesthetic dexterity which scientists acquire in the course of experimental work enabling them to *figure-out* the function and the structure of atoms, molecules, cells, or at other scales, ecosystems, planets and star-clusters. Natasha Myers' ethnography of the work of protein biochemists furnishes many cogent examples:

"According to all measures, Edward is a well-trained crystallographer. He tells me that he takes a 'mechanistic approach' to protein function. His close study of chemical laws and physical properties of proteins have honed his 'common sense'. And yet, this sense of things has also been contoured by a kinaesthetic sensibility that he did not learn from books. It is through the time consuming and laborious process of building models that he cultivated intuitions about how a protein moves and breathes in its watery cellular environment. He engages this kinaesthetic sensibility to animate his hypotheses. Where the model onscreen remains static, he relays the qualities of his breathing molecule by wrapping his hands around an invisible, pulsing sphere. He leans in to the space between us to effect the affects of a lively body."

Myers, (forthcoming, 2015 p. 13-14)

Compelling as this excerpt is, to fully grasp the virtues of body-work in science, it is also necessary to understand the practices of science as being material: As Lynch puts it, scientific data-making occurring on the same textual surface as its 'real world' object (Lynch, 1988; Lynch, 2006). Here the

representational goal of idealization (generalization and abstraction) is held in tension with referential realism (maintaining the singular authenticity of the 'real') and these two (the abstract/generalized constrained by the material/concrete) stand instead of interpretation and criticality in a likewise juxtaposition for the Humanities. As Latour (1999) states there is no mimesis in science (even while imitation, metaphor and interpretation abound in talk *about* science) and "*epistemic things*" (i.e. the specimen which is collected, preserved and labelled in a plant or insect collection; the cells or tissues which are prepared for microscopic examination; the proteins sorted by ultra-centrifugation; or the DNA base-pair bands amplified by reverse transcription and then separated and visualised by polyacrylamide gel electrophoresis) are all "cut of the same cloth" as the material in which they stand (Rheinberger, 2010, p. 243). Perhaps it is this aspect of science practice which is most commonly miss-understood, leading to the view that the ultimate goal of science is dehumanized, mechanised and only then 'objective' (see Daston & Gallison, 2007 for a subtle analysis of the history of scientific objectivity). In fact the making of epistemic things is intrinsically a human practice, requiring a pedagogy which develops an externally directed attention - pedagogy which drawing on knowledge of craft practices (e.g. Gamble, 2001, 2003; Bernstein, 1999; Polanyi, 1958) foregrounding apprenticeship in order to develop an ability to look and see simultaneously (i.e. 'to see – to know' (or come to realize) in the act of looking). This in turn depends upon the inter-animation of 'the model' (the ideal, the abstract and the generalized) and the 'real' (the realized, the concrete and particular) while the patience and the silence needed to attend to these together is an antidote to talk.

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