

# Embodied narratives

Kerry Chappell

Of all the art forms, dance might seem to offer the least opportunity for productive partnerships with science. Yet several groundbreaking collaborations have seen scientific concepts as complex as epigenetics and neural activity in the brain explored through dance. As *Kerry Chappell* points out, dance is fundamentally about creating an ‘embodied narrative’ in which the dynamics of the physical human form communicate meaning to an audience. Partnerships between dance artist and scientist can deconstruct scientific concepts and inspire performances that are both artistically successful and can communicate an essence of their scientific inspiration that words alone cannot convey.

## Introduction

The idea of a creative collaboration between a scientist and a dance artist may initially seem a strange enterprise, bringing together two very different worlds that do not appear to have much in common. But these kinds of collaboration are increasing in both professional and educational settings in the UK, and for very good reasons. Recent collaborations have included, among others, a ‘Choreographing for the Brain’ project, a dance theatre work exploring the scientific explanations of left-handedness, and a touring dance-in-education piece investigating the science and issues of epigenetics.

As more of this kind of work is undertaken in schools, and more practitioners become skilled in developing collaborations, questions are being raised about the activity at the heart of this practice.<sup>1</sup> This chapter seeks to delve into these questions. It particularly focuses on how dance can create embodied narratives and meaning-making around socioscientific issues, and how developing understanding of these contributes to new interpretations of ideas and to new approaches.

Whether we experience dance as a performer or as an audience member, there is something special about the encounter that cannot be easily translated into words. It is difficult to explain any shift that may have occurred, but it stems from gleaning understanding via lived bodies rather than text or spoken words. It makes us rely on our ‘embodiment’, something non-dancers are

perhaps not used to engaging with and interpreting, particularly within a science context.

Embodiment might be thought of in interacting layers: there is the ability to sense a movement or moving from within, there is also the ability to ‘think physically’, and then a capacity to move with an awareness of the whole physical self (Chappell, 2006). The American dance scholar and practitioner Sue Stinson pulls together these layers and how they interact to make a greater sum than their parts: “a way of perceiving oneself from the inside out, where one is aware of feeling, movements and intentions, rather than looking objectively from the outside in” (Stinson, 2004, p. 2). She argues that it is this ability to sense our embodiment that allows us to perceive and feel a dance and then understand our own response to it. For me, empathy – feeling an idea in someone else’s shoes – is also a particularly important part of this process.

When experiencing and making meaning through this embodiment in dance, it is important not to be limited by an understanding of narrative as linear storytelling. This is certainly possible: a story might be told in dance from which an audience can take away a clear sequence of events. A dance may also be plotless, a work with abstract ideas (Preston-Dunlop, 1998). There is also the possibility that a narrative may exist in dance that is not a clear sequence of events, but that communicates a complex felt idea when it interacts with its audience. The dance may not appear logical; meaning gleaned from this more complex kind of narrative may emerge, be felt, be difficult or impossible to put into words. It is this kind of complex embodied narrative, experienced by performers and felt by audiences, that is at play when dance is able to contribute to communicating similarly complex scientific concepts or socioscientific issues.

Before delving farther into embodied narratives within actual dance and science education collaborations, it is worth introducing



Above:  
*Skin Deep*, performed by  
All Change at Sadler's Wells,  
funded through the Wellcome  
Trust's Pulse scheme.  
Tracey Fahy

the different models that are being used for this work to understand how these collaborations have actually been developed, as well as looking at the wider complexity of the relationship between dance and science collaborations (of which embodied narratives are a part).

### **A spectrum of intimacy**

Dance artists and scientists have worked together in educational settings along a 'spectrum of intimacy', with the new, experimental approaches lying in the most intimate collaborations.

At the least intimate end are examples of encounters where science and dance enjoy a mild 'flirtation', where dance/movement presentation techniques have been used to enliven science teachers' practice. For example, classroom science bench demonstrations may be given a sense of art and suspense using movement flourishes and performance ideas. But if, for example, a science teacher merely demonstrates a chemical change with a well-timed dramatic pause followed by the exciting spectacle of vivid colour change and explosion, they are not exploiting the full potential of the dance–science interaction suggested in the phrase 'embodied narratives'.

Science and dance have come closer in projects designed to use performance and dance workshops to engage students in science, as well as offering professional development for classroom teachers in how to do this themselves – for instance, themed dance-based schemes of work focusing on science topics such as the water cycle or physical states of solid, liquid and gas. An example might involve students representing different energy states through the motions of molecules and their arrangement in space. Again, such workshops still do not exploit the full potential of the dance–science interaction in education, although they are fit for purpose.

Fraternising at the more intimate end of the spectrum, and featuring some of the most innovative current practices, are science

and dance collaborations structured in mutually influential relationships, favouring strong discipline knowledge and experience within experts from each discipline. These science–dance–learning interactions are characterised by learning gains for parties within different disciplines, which result from the symbiosis between disciplines. Projects report these gains involving learning about learning, increasing understanding of where the sciences and the arts overlap in their approaches, and acknowledging the differences in order that they can be better understood and appropriately built upon. As such they are a promising culture for developing ‘embodied narratives’.

An example of a project of this type is *Skin Deep*, a digital dance performance created by 58 young Londoners to explore the facts and fiction behind genetic science and its impact on society. All Change, in partnership with Sadler’s Wells, worked with poets, dancers, musicians, digital artists and scientists to create digital artworks and choreography culminating in three digital dance performances. The project was supported by Dr Anand Saggar (a clinical geneticist) and Professor Alf Linney (a medical imaging physicist). This initially open-ended exploration of genetic science reported new learning regarding how dance, new media and scientific modes of enquiry can enlighten all those involved.

So what is going on within these more intimate kinds of collaboration? There are two key points here. First are the conceptualisations of creativity and process that science and dance bring to the melting pot, and how these fuel the symbiosis between disciplines. Second is the question of the kinds of narrative that dance can create around the socioscientific issues at hand, and how developing understanding of these contributes to new interpretations of ideas, and indeed to developing new approaches.



Above:  
Dancers in *Left*, a theatre production by Double Vision supported by a Wellcome Trust Pulse award.

### **Different and yet the same: conceptualisations of creativity**

The arts and sciences are tools for attempting to understand the world. It seems that those science–dance–learning collaborations that are likely to be the most successful in developing understanding will come through the symbiosis of disciplines, as well as the learning within disciplines. Nurturing this symbiosis appears to work best when the differences as well as the similarities between disciplines are acknowledged in practice, allowing for understanding of how science and dance can interact together to stimulate enquiring minds in young people. This is not an argument that has been empirically evidenced, but certainly emerged as a strong opinion within the Wellcome Trust's 2006 'Creative Encounters' seminar, which brought together arts and science collaborators to discuss such issues.

On one level there are obvious and tangible differences in how the arts and the sciences approach enquiry and the creative process because of their underlying epistemologies. Science is based on empirical enquiry about the material world, which yields instrumental and theoretical knowledge. The arts involve an aesthetic approach, at times allowing more space for ambiguity and uncertainty, and at others focused on critical reflection and the capture of valuable ideas. Within the school context, the arts acknowledge the existence of multiple perspectives that incorporate evaluative responses rather than the more illustrative and authoritative science knowledge (Chappell, 2006).

Despite these epistemological distinctions, on another level creative enquiry within these disciplines requires similar abilities, which include: being imaginative, risk-taking, question-posing, question-responding, self-determination, innovation, playfulness and immersion. These particular abilities are being investigated as the core features of what has been labelled 'possibility thinking', which it is argued lies at the heart of creativity (Craft *et al.*, in press). In particular, question-posing is emerging as the driving force of

possibility thinking and creativity. Its relationship with the other features is currently being further investigated via empirical studies in schools. Although the two disciplines of dance and science both utilise these kinds of abilities, how they are manifested within the two domains is different.

*Innervations* (Hampshire Youth Dance Company working with a University of Southampton neuroscientist) provides a strong example of this (Parry, 2004). The project aimed to deepen understanding of the dynamic communication network of the brain through enquiry. In dance, students learned how to explore artistically, for example investigating how to represent the essence of neural networks in an aesthetic and embodied way (one approach was to connect the moving youth dancers using networks made from wool to represent the role of individual proteins at synapses during transmission). In neuroscience, scientifically grounded approaches were taken to students' learning (one exploration involved students taking pictures of neurons with a confocal microscope to aid understanding of conditions such as autism – for example, focusing on mirror neurons, which some studies have suggested are inactive in autistic children when they are attempting to understand emotions in others).

There was also cross-disciplinary learning, where the dance and science enquiry began to feed off each other as tools for attempting to understand the world, via abilities such as imagination, question-asking and risk-taking. Dance sequences grounded in scientific understanding raised questions and responses for the young dancers in process, and their audience in performance, around, for example, how autism might be better understood and perhaps ultimately treated. It also showed how difficult concepts might be more innovatively conceptualised in order to aid better public understanding of the value and contribution of science to everyday life.



Above:  
Participants in the *Innervations* project, supported with Wellcome Trust Pulse funding.

### **How does dance create a narrative around socioscientific issues?**

Given the complexity of the potential symbiosis between dance and science in educational collaborations, we now turn to one aspect of that symbiosis, the embodied narratives that dance can create around socioscientific issues.

As discussed at the beginning of the chapter, whether we experience dance as a performer or an audience member, there is something special about the encounter that we struggle to put into words. We are suddenly required to make meaning out of information through bodies. For some, this request to engage with embodied narratives is perhaps rare. In attempting to understand this, the work of Preston-Dunlop (1998) is particularly useful in explicating some of the mechanisms at play. In asking the question of how dance can create narrative and understanding around socioscientific issues it helps to be aware of the nexus of four elements at work within any dance piece: movement, performers, sound and space. Preston-Dunlop reminds us that choreographers connect the different elements in different ways – some integrating them, some juxtaposing them – developing different styles of connection.

Although dance communicates the choreographer's ideas, it also contains layers of meaning created by the participants in the event, including the performers and the audience. It is not a simple case of sending out a clear message to be received by one and all.

A further layer of complexity is added when we consider that often the kinds of dance within the science–dance–learning collaborations mostly fall within the 'creative' or 'contemporary' category. We are therefore not often dealing with pure dance genres such as Bharata Natyam (an Indian dance form), where each movement constitutes a sign that can be translated, or ballet, where, if we are educated in them, established codes communicate.

We are dealing with combinations of what Preston-Dunlop calls “unstable codes...aesthetic codes...behaviour codes” (1998, p. 10) with which the audience must actively engage to make their meaning.

A code will consist of carefully designed combinations of the four elements: different movements, performers, sounds and use of space. At times use of these codes will create embodied narratives that tell a story, but at other times they will create embodied narratives that are complex and not limited by narrative as linear storytelling. Within the dance, these embodied narratives are also combined with the choreographer’s (and in this case scientist’s and young people’s) “attitudes, preferences, emphases, interests” (Preston-Dunlop, 1998, p. 14). As stated earlier, the dance may not appear logical; meaning gleaned from this combination of different embodied narratives, attitudes, preferences, emphases and interests emerges, and is felt, but is quite often difficult or impossible to put into words. Yet this does not mean it is not understood by performers and audience alike. It is felt and understood in an embodied way.

The Hampshire Dance University of Southampton’s *Innervations* project can provide an example here. If we consider this dance piece in relation to the explanation above, we can begin to understand its power to communicate and interact with its audience via embodied narrative. We start to see how collaborations can move beyond the textbook of traditional science communication strategies to create something more personally and socially profound.

On one level, *Innervations*, the performance piece, was communicating the ideas about science – through the neural network model, using an interlaced network of wool fibres – that the dance artist, dancers and scientists wanted to get across, and to an extent telling a story to do so. Here the physical activity of individual proteins at synapses was being narrated as an embodied

story for the audience, a sequence of quite tangible events using codes made up of components of the dance nexus (movement, space and performers in particular here). The codes being interpreted by the audience were, in this case, quite literal. Movement elements (actions of reaching and gently pulling to create tension in the network), space elements (the dimensions and properties of the wool fibre network containing the movement within a relatively tight and contained space on stage), and performer elements (the very young people who had been exploring the science dancing this particular embodied narrative) combined into codes that allowed the audience to better understand the sequenced activities of the communication network of the brain.

On another level the interactions and transactions of the live performance of *Innervations* were dealing with the personal and social issues that stem from malfunctions of the brain's communication network, such as autism and epilepsy. Developing this angle was perhaps the least story-based and most complex part of the embodied narrative. The disturbance of brain activity, and its experience outside and inside, at the heart of an epileptic episode were brought alive by young dancers performing in unison, using jolting extended fist movements, the other fist tight against the chest, within part red, part sickly yellow lighting. This sequence was not attempting to use the dancers to show what it might look like to see someone have an epileptic episode; it was entering into the realm of the more complex embodied narrative.

If we break the codes down, we can start to understand. I will describe to you part of how I interpret the codes within the description above and how it makes me feel. Fists jolting and held tight against chest are movements that induce in me anxiety, upset, disjointedness, a feeling that something is awry; part red, part sickly yellow lighting filling the space makes me feel nauseous, reminds me of the red of the inside of the brain and its faltering

communication network; together these elements make me uncomfortable, especially being danced by such young people – could this happen to one of them, could it happen to me?

And we must remember that I am describing this in words; I cannot give you here the full complex embodied narrative and my embodied response to it, because when working at its best the interaction is embodied, and cannot be reduced to words. And another person may experience, decode and interpret the codes, containing the creative team's ideas made up of the elements of the nexus, in their own personally and culturally situated way, dependent on their own previous life experiences and attitudes.

This is just one small example drawn from the whole dance piece, but it explains the mechanisms of how, through the use of a variety of codes, and manipulation of the nexus, dance creates complex embodied narratives around socioscientific issues. To step closer towards fully explaining embodied narratives it is also vitally important to understand something of the aesthetic qualities and awareness at play.

Dance's unique integration of aesthetic qualities and awareness via the body into a way of knowing within an art form also informs meaning-making around scientific and socioscientific issues in the above examples. It is the aesthetic 'glue' between the components discussed above that is often contributing to new interpretations of ideas, and indeed developing new approaches. But, even within dance education, there have been recent calls for the re-evaluation and rejuvenation of the aesthetic within education (e.g. Bannon and Sanderson, 2000), as there is a fear that it is being subsumed by other current educational priorities.

Smith-Autard (2002) helps us to understand what aesthetic qualities, awareness and understanding in dance involve. She argues that aesthetic education is essentially an education of

feeling and that “aesthetic perception, though probably something with which we are all endowed, needs, like other kinds of perception, to be nurtured and developed...we need to learn to attend to contained qualities in dance rather than the mere physicalities of bodies in action” (p. 33). The expressive aesthetic qualities in dance are emergent features of the sensory qualities of the dance, as can be seen in the very short example of the epileptic episode from *Innervations* detailed above.

Smith-Autard also draws on Gibson (in Abbs, 1989, p. 58), whose words are especially pertinent to this discussion:

Feelings show us the limits of our language. They bring home to us that language is not omniscient; for we know far more than we can say. It is when we try to put into words our feelings, when we attend to explore our inner states (states that vividly and significantly exist, have reality and are of profound consequences for action) that the gap between language and experience is starkly exposed. It is such moments we must turn to poets and artists, not scientists, for genuine illumination... Feelings...are processes not products...they are grasped and intuited only in their moment of experiencing...It is with this present, shared, experienced, nature of emotions in mind that we return to the question of the education of feeling...

It is this complex understanding of feeling within art, not anything so simplistic as the expression of emotion, that is at play in the best science–dance–learning collaborations. Dance artists are highly skilled in this ‘education of feeling’ and traditionally undertake it by engaging young people in the three interrelated processes of creating, performing and viewing in order to generate an appreciation of dance as art (e.g. Smith-Autard, 2002). The young people in projects such as *Innervations* will have had the opportunity to engage as creators, performers and viewers generating, embodying and receiving/interacting with complex

ideas, feelings, emotions and narratives about neuroscience, related conditions and the connected socioscientific issues.

Within these collaborations, young people are therefore experiencing the best of both worlds. They are able to engage with the ‘illumination’ possible through the ways of knowing in dance and other art forms, as well as simultaneously engaging with the scientific way of knowing and its product. They are able to work to use the synthesis of dance and science in attempting to understand the world.

### **Conclusion and moving forward**

The idea of a creative educational collaboration between a scientist and a dance artist is one that is not so far-fetched. There is growing opinion that when dance and science interact in intimate educational collaborations that acknowledge discipline similarities and differences, there is the potential for learning within disciplines, as well as a symbiosis between disciplines that leads to wider learning. One part of this symbiosis is the way in which dance can create powerful embodied narratives and make meaning around socioscientific issues.

Fundamental to the development of these narratives and their interpretation by performers and audiences is understanding from within dance, regarding the complex mechanisms for making dance and its constituent codes, integrated with aesthetic understanding and awareness. Embodied narratives are difficult to understand for those not accustomed to gleaning and interpreting information through the body. Practitioners need to raise the profile of what it means to understand in an embodied way if this work is to go farther. A science educator who had been employed in a collaborative project to lead post-dance-performance discussions commented that people don’t always ‘get’ the dance and they need to talk to fully understand. There is no question that this supplementary talk is very valuable, and critical discussion is a

strong component of dance-making and the dance community. But we need to better understand the embodied in these collaborations to re-address the balance. It would be beneficial to collaborations if the default position was not immediate attempts to translate the embodied into the spoken, but acceptance that the embodied is as valid a form of understanding.

We must also work to experience embodied narratives on a scale from sequential storytelling to the communication of complex felt ideas that may not have a straightforward narrative form – and, in fact, acknowledge that both these things may be going on simultaneously. The range of embodied narratives have the potential to tell a story or sequence of events to explain the science. But they can also stimulate the performers and audience to engage in questions grounded in feelings about, for example, what it means to experience epilepsy from the inside and the outside, how we might be able to understand autism and its dislocation and why this is important. As two epigenetics/dance project students (the first an audience member, the second a performer) put it: “compared to if you’re learning epigenetics in a textbook, if you see it [the dance performance] you understand it more, about the shapes and stuff. It’s much better than looking in a book because you see it happening,” and “cos it’s about you; why not know about it”.

Finally, it is important to maintain wider questioning about what is going on within collaborations. The focus on embodied narratives within this chapter has shone the spotlight most strongly on dance products and their interaction with the audience, but we need to continue to debate about the contribution of the dance process, particularly in terms of how it interacts with the scientific processes in symbiosis.

In relation to this, it is important to pay attention to complementarities and tensions within collaborations: process needs space alongside product; story needs space alongside complex felt ideas; the known needs space alongside the unknown; bodily expression needs space alongside verbal expression. And I would suggest that each pair's role needs acknowledging within both disciplines. This is difficult, but it is often dealing with challenges such as this that sparks new approaches, some of which are already inherent within the strongest science–dance collaborations.

1 This chapter is focusing on collaborations between scientists and dance artists that develop young people's arts work engaging with science. It is not attempting to deal with current debates and questions about epistemology and meaning-making from within the developing discipline of dance science.

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