Introduction
Toward a biocultural performance studies

> . . . [O]nce most people really come to understand what an embodied conception of mind entails, they are going to be upset about it. Much of what they hold dear is at stake – their view of mind, meaning, thought, knowledge, science, morality, religion, and politics.
>
> Mark Johnson, *The Meaning of the Body, 15*

Deceptive categories

There is no longer any doubt – the performing arts are good for learners! Several studies in the 1990s demonstrated that students K-12 who engage in music, theater, and other performance activities in school score higher on academic tests than students who did not have this benefit. Most of these early studies were conducted before the experimenters could begin to explain why and how, from a neurocognitive point of view, the performing arts had such apparent effects on the minds and actions of school children. The 2008 longitudinal study, *Learning, Arts, and the Brain: The Dana Consortium Report on Arts and Cognition*, organized by the celebrated neuroscientist Michael Gazzaniga, however, went further by opening up the complex cognitive processes involved in learning through the arts. Gazzaniga and his thirteen associates, working at neuroscientific labs in major US universities, deployed recent findings about learning and fMRI (functional magnetic resonance imaging) studies of the brain to investigate correlations among learning through the arts, skills in other areas of knowledge, and changes in the brains of learners. *Learning, Arts, and the Brain* confirmed the earlier findings from the 1990s and began to chart the still murky territory of brain plasticity and performance.

Among Gazzaniga's and his team's more impressive results, these stand out: "An interest in a performing art leads to a high state of motivation that produces the sustained attention necessary to improve performance . . . in other domains of cognition"; "Specific links exist between high levels of

music training and the ability to manipulate information in both working- and long-term memory"; "Training in acting appears to lead to memory improvement through the learning of general skills for manipulating semantic information"; and "Learning to dance by effective observation is closely related to learning by physical practice, both in the level of achievement and also the neural substrates that support the organization of complex actions" (Gazzaniga 2008a: vi). Although training in all of the arts motivates and improves learning in a range of tasks, one study compared performing arts students in music and theater to visual arts students and found that the former were "more likely to be engaged in symbolic retrieval (i.e., the recollection of words and other symbols) than non-performing arts students" (2008: 90). In his overview of the findings, Gazzaniga concludes that "the consortium's accomplishments to date have included bringing together some of the leading cognitive neuroscientists in the world to sort out correlative observations on the arts and cognition, and to begin the analysis of whether these relationships are causal" (2008: vii–viii). On the basis of the pathbreaking Dana Consortium Report, testing for such causal relationships has been ongoing and productive in the last several years. Recent studies and results are available in *Art for Art's Sake? The Impact of Arts Education* (2012), by Ellen Winner, Thalia Goldstein, and Stephan Vincent-Lancrin.

This is welcome news and should prompt those of us in performance studies to probe its implications for our work. At the very least, the current belief that only certain kinds of performances can be fully "performative" – that is, effect actual changes in our lives – should be questioned. Now it appears that all kinds of experiences in planning, rehearsing, and performing music, theater, and dance events reshape our brains. This is important because how neuronal networks interact with the rest of our minds, as well as with our bodies and environments, is arguably at the root of who we are and what we can do. Further, the reality and effectiveness of all performance touches on a distinction that most academics make between the arts, as a general area of experience, and what usually get called the "applied arts," in which music, theater, and other arts are applied in therapeutic and/or social arenas to produce practical results. If artistic experience always changes our minds in material ways, however, is there really a fundamental difference between "aesthetic" and "practical" results? Despite these far-reaching implications, most academics in performance studies have been reluctant to engage with the science that has been transforming our area of study and that is legitimating (if not yet producing) increased spending in arts education.

In this Introduction, I will suggest several reasons for the refusal of most arts and humanities academics to use scientific knowledge in their work. One of the most important of these causes is that artists, teachers, and researchers in the performing arts have been socialized to believe that their work is distinct from other areas of human endeavor. Our present divisions among schools and departments in most universities in the West – including the distinctions that set schools and departments of the arts apart from other areas of learning – are based on principles that we inherited from the Enlightenment, primarily from John Locke and Immanuel Kant. Many universities divide education in the arts from learning in the sciences on the basis of what Enlightenment thinkers understood as psychological "faculties," a term that retains some of its double meaning for academics today. Following Kant, educators in the arts believed they were teaching students how to use the faculties of their senses and feelings, while institutional arrangements featuring instruction in science and math involved what those teachers took to be the "faculties" of imagination and understanding.

As cognitive philosopher Mark Johnson points out, Kant and other Enlightenment philosophers relegated the arts to the realm of feeling and emotion, separating performance from cognition and practice. As a result, most Enlightenment aestheticians came to believe that artistic experience could play no role in shaping the self or the world. States Johnson, "[Faculty psychology] reinforced a pervasive mind/body dualism and generated a series of foundational dichotomies between the 'higher' faculties and functions and the 'lower' ones – understanding versus sensation, cognition versus feeling, reason versus emotion" (Johnson 2007: 210). From this perspective, the emotional delights of the arts relegated so-called aesthetic experience to the 'lower' side of each of these dichotomies. Performance and the visual arts could inspire the disinterested contemplation of beauty and passion, but such judgment need have nothing to do with one's practical, ethical, and political commitments. Even though most of us no longer accept Kantian aesthetics and the Enlightenment dichotomies on which such formalism is based, we live in academic institutions that continue to separate the arts from other "faculties" of knowledge, including the neuroscience of Gazzaniga and his colleagues. Our institutional arrangements reinforce our parochialism.

One could argue, however, that Gazzaniga and his neuroscientists are also perpetuating a kind of "faculty" psychology deriving from the Enlightenment in the way they have framed many of their questions about the arts and education. Summaries of their work suggest that the performing

arts – the kind of learning that students do when they practice a musical instrument or rehearse a play – are indeed separable from other areas of learning. Further, it seems that such artistic experience is especially praiseworthy when the skills learned in rehearsal and performance can be transferred to other areas of education. One of their studies, for instance, found that "there appear to be specific links between the practice of music and skills in geometrical representation" (Gazzaniga 2008a: vi). While we might want to join the neuroscientists in applauding the discovery of this correlation, we should also pause to consider its implications. Are the arts only "good" for children when experiencing them facilitates the transfer of skills from a 'lower' activity such as music to a 'higher' one like geometry? Turning this assumption on its head, we might also want to know whether the improvement of a child's skills in geometrical representation will help that person to become a better trumpet player. Gazzaniga and his colleagues did not pursue answers to that question, however. Neuroscientists also live in academia; the remnants of "faculty" psychology partly shape their assumptions and questions as well as our own.

There is another way to approach this problem, however – one that will open a path to the thesis of this book. Instead of using such categories as "the arts," "geometry," and others that derive from Enlightenment faculty psychology, we need to move beyond these deceptive categories to get at what actually happens in interactions among the brain, the body, and the environment when people learn, practice, and enjoy performances and similar kinds of events. Because the Dana Consortium sought to influence the public debate about the arts in education, Gazzaniga and his colleagues framed their questions and investigations in terms and values that politicians, educators, and parents could understand, appreciate, and perhaps act upon. In the West, reading and math skills are valued more highly than training in singing and dancing; it is no surprise, then, that the question of transference from the arts to higher-valued areas in the curriculum should arise. But the current curriculum of western schools and universities cannot be mapped onto specific areas and functions of the brain. There is no single place in the mind where reading happens. Doing a math problem draws on many distinct mental functions, including human emotion. And when students act a role in a play, they engage in memory, attention, empathy, executive control, and a host of other skills, several of which overlap with the brain functions that animate reading and mathematics. In short, the psychological faculties isolated by Enlightenment thinkers – faculties that continue to shape our categories of schooling and thinking at all levels – have little to do with the actual interactions of brains, bodies,

and environments, as biologists, neuroscientists, linguists, anthropologists, and others shaped by the "cognitive turn" are beginning to understand. Our common-sense categories to denote different kinds of learning do not align with cognitive realities.

Of course the neuroscientists who contributed to *Learning, Arts, and the Brain* understood many of these complexities, even though they fashioned their findings in accord with public expectations. In the case of the music and geometry study, for example, chief investigator Elizabeth Spelke and her associates at Harvard based their investigations on their prior knowledge of three core cognitive systems that lie at the foundation of numerical reasoning. These systems, which emerge in infancy and retain enough plasticity to enable learning into adulthood, undergird and animate specific kinds of skills in both music and geometry. Spelke's hypothesis, that training in music might enhance certain skills in mathematics and geometry, was based on her knowledge of these three foundational systems and her hunch that improving their operations through musical training would enhance skills in other areas of the curriculum supported by these systems. In other words, Spelke's contribution to the Consortium Report was not based on a simple notion of "transference" from instruction in the arts to the sciences. Notice that no transfer – in the sense of taking skills from the "music" area of the brain and transferring them into the "geometry" part – actually took place. Rather, as she emphasized in her conclusion, "our findings underscore both the importance and the feasibility of breaking down children's complex learning capacities into component systems at the foundations of human knowledge" (2008: 47). Children's skills in both music and geometry benefitted when the core "component systems" that support both areas of learning were stimulated and enhanced.

Spelke's approach prompts a larger question that will inform much of this book: What are the foundational "component systems" that shape the practice and enjoyment of human performance? While we should suppose that these systems support many areas of human activity – that none of them is specific to performance, *per se* – we do want to know how these component systems bring shape and purpose to making and experiencing the broad range of activities that we generally include as performances. As Gazzaniga's scientists knew, they would have to ignore the institutional organization of knowledge and brush aside conventional categories and understandings in several disciplines to get at the answers to a similar question about learning and the performing arts.

The problem with institutional categories for areas of learning also relates to the general definition of performance. Given the public purposes

of their funding, Gazzaniga and his colleagues were looking primarily for links between "the arts" and learning in other areas of the curriculum. Nearly all definitions of performance, however, have encompassed areas of human activity that are not usually included in "the arts" and many of them are not taught in schools. These range from stand-up comedy and horror movies to tribal rituals and campaigning for political office. Richard Schechner and others began including these kinds of activities under the umbrella term of "performance" in the 1970s, and any book or article that attempts to define the general parameters of the category must include them or explain the reasons for their absence. From my perspective, these activities are indeed "performance," but it is clear that conventional approaches to "the arts" or any other faculty psychology still informing school curricula will not take us very far in understanding their operations.

The neuroscientific investigations of Gazzaniga and others point us toward a way of resolving this problem. If we can determine most of the underlying component systems that support and enhance the practice and enjoyment of "performance," broadly conceived, we are on our way to defining the scope and attributes of performance as a category of human activity. Just as there is no single area of the brain for "geometry," there is certainly no "performance module" that controls how our minds and bodies create and respond to the full range of performances. The cognitive sciences have advanced far enough, though, to enable us to identify several of the core systems that work together to support performance activities. The results of *Learning, Arts, and the Brain* confront us with a major problem to investigate: What are the common component systems that are necessary to generate and support all performances, from grand opera to krump dancing?

Beyond the "Two Cultures"

Before trying to answer this question directly, however, it is necessary to sketch the wider context of the "cognitive turn" in the humanities and its implications for the production of knowledge in our culture. The cognitive sciences have not only undermined our institutional categories and arrangements for investigating the performing arts and other areas of school curricula, they have also destabilized the traditional foundations and assumptions of knowledge across the humanities and the sciences. Artists and scholars in performance studies – that is, my colleagues in musicology, theater arts, sports, anthropology, film studies, religion, history, communication, as well as in specific performance studies programs – need

to understand that they are not alone in questioning what counts as knowledge in our field. But we also need to confront the immensity of the problem before we can begin to chart a way out of the epistemological straightjacket that we in performance studies have helped to create. An introduction to our difficulties properly begins by recalling a lecture given at Cambridge University by British novelist and scientist C.P. Snow in 1959, entitled, "The Two Cultures." Snow later published an expanded version of his talk entitled *The Two Cultures and the Scientific Revolution*. As we will see, the ability to maintain clear divisions between the cultures of science and the humanities, although a no-brainer in 1959, is fast eroding.

Until about twenty years ago, scientists in linguistics, psychology, neuroscience, and biology had little to say to us humanists that seemed relevant to our work. Floating in our separate academic bubbles, humanists and scientists played out Snow's dance of the "two cultures" for most of the twentieth century. We recognized that we had distinctive kinds of truths, used different methods to pursue them, and supported our claims through separable types of evidence and argumentation. Near the end of the century, however, some scholars challenged what was for most of us a generally benign division of labor. A few humanists, convinced by one or another theory of poststructuralism, stated that "science" was a Relativistic discourse like any other and denounced as a power-grab scientific ideas that claimed some possibility for Objectivity. Despite the Sokal hoax and other revelations of the hollowness of such arguments, more humanists followed them into the anti-science trenches, believing the fight was ethically and epistemologically worthwhile. Most scientists ignored the skirmish, but some dug their own trenches to plant the flag of Objectivity and fight back against humanist foolishness and envy.

Although this contest continues among some scientific and (post)humanist warriors, most of us can see that the old epistemological battle lines have shifted, partly dissolved, and in some areas, even melted away completely. The fights in the 1990s about the validity of experimentation versus experience, the importance of nature over nurture, or the superiority of objective to subjective truths have dissipated, as both sides are beginning to realize that they can justifiably claim neither position as their own. The evolutionary and cognitive sciences have been at the center of this epistemological sea change. While philosophers attentive to these disciplines now understand that the sciences have the empirical tools to turn age-old philosophical dilemmas into relatively straightforward scientific problems, they also know that solving these problems will not deliver Objective Scientific Truth.

This is because our evolutionary inheritance and cognitive abilities, however marvelous, also prevent us from acquiring a God's-eye view of ourselves and our world. As cognitive literary critic Ellen Spolsky notes, "Precisely because the human species and its ways of knowing evolved by the accumulation of random mutations in interactions with changing environments rather than genetically engineered for the task of knowing, it is not at all surprising that they are unstable . . . The evolutionary success of the species would actually be compromised by an entirely rigid, that is, dependable, way of knowing" (Spolsky 2001: 52). Just because Objectivity is impossible, however, does not doom us to the epistemological chaos of Relativism. I agree with most pragmatists that such binaries set up false oppositions and expectations. With the collapse of the old poles of Relativity and Objectivity, however, it is clear that humanists and scientists are now standing on much the same spongy epistemological ground; neither can retreat to the previously rock-solid knoll of one or the other academic culture. This may be the first time since such Enlightenment academics as Descartes, Newton, Locke, Diderot, and Kant began dividing the sciences from the humanities that new knowledge is forcing us back together again. This is frightening but also salutary. We have much to learn from each other and it's important that we do so; there is a lot of work to be done.

Regarding another old dichotomy, Experience versus Experimentation, some scientists are now finding that both approaches are necessary. Cognitive scientists Varela, Thompson, and Rosch, for example, warned their colleagues back in 1991 that "to deny the truth of our own experience in the scientific study of ourselves is not only unsatisfactory; it is to render the scientific study of ourselves without a subject matter" (Varela, Thompson, and Rosch 1991: 13–14). These scientists have found that the rigorous first-person perspective of phenomenology can be an important corrective to the attempt to maintain a third-person aloofness, which remains the norm for most scientific investigation. As we will see, several more cognitive scientists working within the paradigm of Enaction are also discovering that their truth claims can be enhanced through phenomenology.

Perhaps the primary reason for the collapse of an Enlightenment approach to epistemology is the assumption that the mind is a "blank slate." Most academic disciplines in the humanities subscribed to the notion that social learning was more important than inherited nature – a belief that had been prevalent in the West since the dominance of Lockean psychology underwrote much of the Enlightenment. This view may be epitomized in a remark made by the former president of the Modern Language Association,

Robert Scholes: "Yes, we were natural for eons before we were cultural – before we were human even – but so what? We are cultural now and culture is the domain of the humanities" (Scholes quoted in Fromm 2009: 263). This Lockean belief also provided humanists with a moral agenda. For if *Homo sapiens* as a species has no inherent qualities, if culture is entirely learned, our political and social systems are fully contingent and changeable. In such a world, humanists could help to expose the depredations of power, propose possible alternatives, and bring about a fairer society. But evidence from the biological and cognitive sciences is rapidly piling up that our species is born with an elaborate cognitive architecture, which includes a surprising number of psychological predilections as well as genetic constraints. Like other animals, we were born with certain mental and physical capabilities acquired through evolution that help us to survive. While it's true that human cultures vary widely, that may have more to do with our cognitive flexibility in adapting to different ecologies than with any learned behaviors metaphorically inscribed on a Lockean mind without innate content.

The arbitrary separation between nature and nurture encouraged many social scientists to believe that they could rule out biology and genetically derived cognitive dynamics as having anything to do with things social or cultural. From the point of view of much current cognitive science, however, this view is seriously incomplete. The social constructivist accounts of Erving Goffman, Michel Foucault, Victor Turner, and many other sociologists, historians, and anthropologists who have influenced performance studies fit comfortably within what John Barkow, Leda Cosmides, and John Tooby attacked as the "Standard Social Science Model" (SSSM) of the human mind. Barkow, Cosmides, and Tooby first questioned this model in *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, a paradigm-shattering book at its appearance in 1992. In their introductory essay, they stated:

> The Standard Social Science Model requires an impossible psychology. Results out of cognitive psychology, evolutionary biology, artificial intelligence, developmental psychology, linguistics and philosophy converge on the same conclusion: A psychological architecture that consisted of nothing but equipotential, general-purpose content-independent, or content free [cognitive] mechanisms could not successfully perform the tasks the human mind is known to perform or solve the adaptive problems humans evolved to solve – from seeing, to learning a language, to recognizing an emotional expression, to selecting a mate, to the many disparate activities aggregated under the term "learning culture." (Barkow, Cosmides, and Tooby 1992: 34)

Barkow, Cosmides, and Tooby recognized that leading social scientists had assumed the SSSM model of human cognition and behavior for much of the twentieth century. The once firm divide between Nature and Nurture has dissolved, as have the other two dichotomies, and we are only beginning to make a different kind of sense of who we are and what we can know and do in the world. This recognition of new realities undermining old certainties has already destabilized the sciences and is spreading into the social sciences and humanities.

The shifting fault lines among the epistemological plates upon which our old disciplines rest have begun to shake things up in theater and performance studies. As occurs at the beginning of any paradigm change, however, these rumblings have mostly been felt at the margins of our field. Most performance academics, like most humanists and scientists, have ignored these cracks in what still seems like solid ontological and epistemological ground. Nonetheless, several of us have successfully demonstrated that the assumptions of Saussurian semiotics are ill-founded, that the poststructuralism of Derrida and others does not accord well with cognitive realities, and that the psychoanalytic tradition, from Freud to Lacan to Butler and Zizek, is inadequate and misleading from a scientific point of view. On the other hand, many of the new realities revealed by evolutionary and cognitive studies do jibe with aspects of phenomenology and varieties of materialism. In addition to posing challenges to still-current theories, those of us working in cognition and performance have successfully questioned assumptions about the willing suspension of disbelief, the attribution of meanings to performances, the rationalism behind *Verfremdungseffekt*, and many other conventional ideas and strategies in our field.

For many scholars in performance studies, however, epistemology and methodology have always been less important than morality. Pick up any journal in the field, and our rhetoric of ethical earnestness practically jumps off its pages. Partly because the performance events we study have so often been dismissed as mere entertainment, we have felt the need to insist that our scholarly "interventions" weigh in on the side of the angels. In retrospect, the putative fight between "performance studies" and "theater arts" in the 1990s was mostly about moral positioning, as each side claimed that it was better equipped to deliver politically progressive purity and radical change. Given the cultural habitus of our academic tribe, we tend to grab for handy definitions of racism, objectification, and identity, for example, regardless of their ontological and epistemological baggage.

My point is not that we should abandon our ethical concerns. Some performances, such as gladiatorial contests and racist lynchings, certainly