



Members of Random Dance in *Becoming*, a work involving a digitized partner seen through 3D glasses.

DAVID BICKERSTAFF

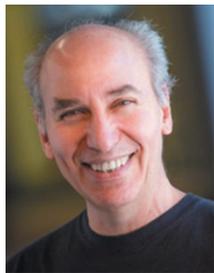
COGNITIVE SCIENCE

Leap of thought

Ewen Callaway meets cognitive scientist David Kirsh, who works with choreographer Wayne McGregor.

Sadler's Wells Theatre, London's leading venue for contemporary dance, is a second home to cognitive scientist David Kirsh. On a muggy September day, young dancers loitering between rehearsals greet him with hellos and hugs. Anna Nowak — a member of Wayne McGregor Random Dance, a company known for its highly kinetic, technologically inspired productions — dashes over to tell Kirsh she loved *Thinking With the Body*. This exhibition, at the Wellcome Collection in London, explores a decade of collaborations between McGregor's company and scientists such as Kirsh.

A visitor could walk through the small show in minutes. Yet *Thinking With the Body* rewards a longer look — particularly the documentary-style videos that show the deep nature of the company's collaborations. Unlike in many science-art partnerships, in which the intersection between the two camps can be tenuous at best, McGregor and his partners all gain much more than a line in their CVs. "I think what is vital in genuine collaboration between art and science is the notion that neither is in the service of the other," McGregor said in 2009.



Scientist David Kirsh.

The most fruitful of these partnerships seems to be the one with Kirsh, who works on embodied cognition — how the body influences thought. Kirsh, who is associate director of the Arthur

C. Clarke Center for Human Imagination at the University of California, San Diego, started studying embodied cognition in McGregor's company after observing the choreographer's creative process in London five years ago. He was gobsmacked. "There were dozens of phenomena just dripping in this two-hour display, which would clearly bear careful study," says Kirsh. He was particularly interested in the instructions that McGregor gives to his dancers, which often involve cognitive tasks such as asking someone to move in response to a strap on another dancer's clothing. "These are techniques that give the dancers material they can think about that will generate movement forms that perhaps have never been done before," says Kirsh. McGregor is known for bizarre-sounding instructions to dancers (such as "dance like a skyscraper") to spur them to invent movements that might be used in performances.

As with any scientific project, Kirsh began studying Random Dance by characterizing the different phenomena he saw "like a botanist", he says. "I go out with six or seven

Thinking With the Body: Mind and Movement in the Work of Wayne McGregor Random Dance
Wellcome Collection, London. Until 27 October 2013.

high-definition video cameras, I put them around the studio floor and collect everything from the moment he introduces a dancer to the premiere weeks later." He and a trained team of students then deciphered the different techniques for instruction and practice that they saw in the videos, in much the same way that primatologists characterize behaviour.

One phenomenon that caught Kirsh's attention was 'marking', in which dancers in rehearsal elaborate only the basics of a dance movement. "It's a lower-energy version; they won't stretch as far; they won't have the emotional force in it. It's a way to avoid injury and because you can't dance for five hours after two hours of exercises warming up," Kirsh says.

But as he discovered when conducting a controlled experiment, there is more to it. He showed dancers a new routine, gave them time to learn the moves, and divided them into three groups to practise again. One group performed the full movements, a second marked them, and a third lay down and imagined themselves performing the dance. To Kirsh's surprise, the dancers who marked the routine executed it most faithfully later. "Nobody predicted this," he says. "This is the hint at a theory of practising, and now it's open to study this much more carefully to understand how people focus on aspects of what they're practising." The experiment, he feels, is evidence of physical activity influencing thought.

On the basis of his work with Random Dance, Kirsh has published research papers on interaction design, McGregor's creative process and a phenomenon that he calls distributed memory, in which dancers remember dozens of complicated movements through physical cues from other dancers. McGregor, too, has gained from their collaboration. When he instructs dancers and other young choreographers, he now uses terms that Kirsh devised, such as 'sonifications' — sounds that choreographers make to guide how a dancer shapes a move, such as "yah ooh ehh". Kirsh notes, "Now that the term has been named, the phenomenon is clear." Helping Kirsh to understand choreography has made McGregor more self-aware of his own creative process. Kirsh also studied how the dancers interacted with computer-generated forms during rehearsals for *Becoming*.

Other scientists who hope to get as much out of their partnerships with artists could begin by adopting the perspective of their study subjects to understand them and their work, Kirsh says. "The way I came in was partly as an ethnographer, somebody who tries to understand that particular culture as an insider rather than as an outsider," he says. "The more deeply you understand that, the better your discourse with that artist is." ■

Ewen Callaway is a reporter for Nature.

WAYNE MCGREGOR RANDOM DANCE