

The Art and Science of Leadership

Charles J. Palus

Leadership is an art. Leadership is a science.

Which is it?

I think that most of us accept leadership as both, practicing it with all the knowledge and experience at our disposal. But what does it mean to say that leadership is *both* an art and a science? Science and art often seem opposite. They tend to be disconnected in our educational systems, workplaces, and communities. And many scientists are warning that science is under attack from those who regard it as a set of opinions rather than a source of objective truth. Can science and art thus be so readily mixed in the practice of leadership? If we value the objectivity of science, can it really be a good idea to blend in the biases of artistic construction?

For some time now, my colleagues and I have been studying how people successfully understand and resolve complex challenges—those that do not yield to unambiguous technical solutions—in their shared endeavors. We have worked with a wide variety of people, including leaders as well as scientists and artists. As I watch them explore challenges in their work, I am struck by the relatedness of science and art—not in the specific products, which indeed tend to be very different, but in the underlying processes. Perhaps science and art are not so different. If we knew more about the ways they are alike, we

could better apply their combined power to leadership situations.

I define *science* as careful observation in the course of forming and testing of ideas, subject to a questioning community. *Art* I define as the modification of things by human skill to achieve form, function, and meaning

What are the underlying ways in which science and art are related?

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(obviously this includes much more than the fine arts). Although specialization often requires high levels of expertise, notice that these general definitions have the potential to embrace the activities of all sorts of people in organizations, including leaders.

FINDING CONNECTIONS

What are the underlying ways in which science and art are related? There are many, and they vary by specialty; here I offer four that I think are fairly general: science and art are sensually rich, personal, based in inquiry, and experimental. According to prevailing stereotypes,

the first two of these characteristics are strongly associated with art and the latter two with science, but let's look instead at the connections. Remember, these describe underlying processes—*how* to do the work—rather than the final products.

Science and Art Are Sensually Rich

Art is, of course, but is science? From its origins in primitive astrology and agriculture, empirical science has always been an arena for heightened sensory taste and perceptual awareness. It is true that our senses—vision, touch, taste, sound, and smell—can be unreliable, and that machines have changed the way we use our senses for precise observations. But adequate reliability and precision have come through training and enhancing the senses rather than avoiding their use. Barbara McClintock spent a lifetime observing heritable features on ears of corn she raised; the genetic patterns she saw led to a Nobel prize in medicine. McClintock's knowledge was based in ceaseless and skillful looking. Her biographer defines her distinctive talent as *eyesight*, a powerful means of *insight* based on a continuity between mind and eye.

What are the equivalents of eyesight in the domain of leadership?

Science and Art Are Personal

Once again, art is, of course, but is science? To be valid, scientific

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knowledge must eventually stand independently from its originators. But it is equally true that scientists invest enormous personal passion in their work. Scientific work often takes on the character of a quest, replete with all manner of so-called unscientific beliefs, tastes, and biases. Successes emanating from such personal pursuits are well documented. Isaac Newton articulated the laws of motion and calculus while pursuing alchemy and magic. The voyage of the HMS *Beagle* defined the person of Darwin, who in turn defined the study of evolution. Personal bias in science is corrected not by eliminating the personal but by peer review, further research, and (sometimes) by the practice of critical self-awareness.

How do we both encourage and correct for the personal in leadership situations?

Science and Art Are Based in Inquiry

Science is, of course, but is art? These days we are bombarded by art designed to shock or manipulate, but most art (as I have defined it) is part of a question-rich conversation—an inquiry—between the artist and the viewers, users, of the art. As an example, consider the invention of point perspective during the Renaissance. Previously, the mural and the mosaic had been the dominant visual artistic devices, very effective in portraying icons and biblical narratives. Giotto and his colleagues introduced the then-startling technique of representing the world from a single, geometrically precise point of view, thus obtaining a unique perspective. This technique embodied a question, one that was to prove fruitful: What happens if we look at the world in this new way? This inquiry quickly spread to cartography, navigation, architecture, and engineering.

How can leadership sustain fruitful inquiry into complex challenges?

Science and Art Are Experimental

Once more, science is, of course, but is art? Although art is often viewed as mainly an expressive outlet not given to sober testing, in most cases, rational experimentation plays a central role in the ongoing process of creating good art. Potters, for example, are akin to cooks and chemists when they develop recipes for clays and glazes, keeping detailed records of their tests and forming guiding hypotheses. Very few artists are aloof from the opinions of their audience or customers and at least implicitly experiment in making their work more desirable or effective.

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Surgeons are often viewed as artists, and operations are creative acts within tight constraints. Surgery is based in experiments in the field and more informally in the work of individual surgeons as they analyze their experiences. The term *operator* as applied to surgeons originally had negative connotations of sleight of hand, and rational experimentation eventually was the element that elevated surgery from quackery to a robust and respectable art form.

What is the role of leadership in promoting experimentation?

TWO CAUTIONS

The research my colleagues and I are conducting suggests that these crossing points between science and art can also

enhance leadership for groups addressing complex challenges. But two cautions are in order. First, an adequate level of competency is required in these processes. For example, it helps considerably to be aware of and to value what is highly personal to you in your work and to be able to *depersonalize* when necessary. And experimentation requires discipline, practice, and group support. Second, these four processes are (ideally) mutually correcting and should be used together in concert: inquiry and experimentation help individuals resolve sensory and personal biases, and vice versa.

Human intelligence is perhaps not so radically different across its various endeavors as it sometimes appears. I close with a story of how two very different communities found leadership at the intersection of art and science. Robert Wilson was the founding director of the Fermi National Accelerator Laboratory (Fermilab), the high-energy particle accelerator facility at the forefront of modern physics. Wilson, a leading physicist and an accomplished sculptor, designed Fermilab as an embodiment of the aesthetics of science, in the belief that “the way science describes nature is based on aesthetic decisions.” He modeled the administration building on the proportions of Beauvais Cathedral in France (once referred to as the Parthenon of French architecture). Wilson admired the community of medieval cathedral builders and compared them to the community of accelerator builders: “Both were daring innovators, both were fiercely competitive along national lines, but yet were basically internationalists. . . . [The cathedral builders also] recognized themselves as technically oriented; one of their slogans was ‘Ars sine scientia nihil est’”—that is, “art without science is nothing.”

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