

# Artistic research and Pasteur's quadrant

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In an attempt to give artistic research a 'home' in academia, some people compare it to the kinds of applied research and experimental development we encounter in the field of engineering and technology; others compare it with the socially engaged strategic and action research more readily associated with the project of social engineering in the applied social sciences; and still others liken it to the search for fundamental understandings of specific phenomena which is characteristic of the humanities. Yet all such attempts remain caught up in the standard model of basic research, applied research and experimental development that has been widely accepted since the Second World War and is codified by the authoritative *Frascati Manual* (OECD 2002), a publication of the Organisation for Economic Co-operation and Development dealing with 'standard practice for surveys on research and experimental development'. The definitions and classifications laid down in the *Frascati Manual* serve as *the* reference categories when it comes to describing and defining what research and development are. All self-respecting research institutes, and universities in particular, use the manual as a guideline for their actions.

This model is criticised for its limited capacity to describe the value of the types of research that are the motor of technological innovation and economic growth. In particular, the priority given to basic research over applied research and experimental development is seen to no longer reflect the diverse reality in the science system, where what Gibbons et al. call 'Mode 2 knowledge production' is gaining increasing ground.<sup>1</sup>

In his book *Pasteur's Quadrant: Basic Science and Technological Innovation*, Donald E. Stokes (1997) likewise opened the attack on the standard model of scientific research and development. He followed a line of reasoning that might be suited to understanding artistic research within the framework of research and development. In his criticism of the standard model, Stokes identifies two aspects of the model which he argues are dominant. He sees these as direct consequences the 'golden formula' that basic research is the pacemaker of technological progress, and is performed without thought of practical ends. The first aspect concerns the model's orientation; its point of departure is basic research. This is viewed as the original source and motor to progress in science, including the offshoots of basic research –

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<sup>1</sup> Cf. Gibbons et al. 1994.

the more applied research and experimental development of new products that are important to economic and social life. The ascendancy of basic research over applied research and experimental development is still recognisable in the mission statements of national and supranational research institutions. As a constraining paradigm both inside and outside the academic world, it continues to dominate the minds of many. The accomplishment of Stokes, as well as of Gibbons et al., is that they expose the inadequacy of this well-nigh causal logic. In reality, applied research is just as likely to elicit fundamental questions as basic research is likely to motivate the development of applications. At best, the standard model would have to operate in two directions.

Basic research therefore does not constitute the foundation on which the edifice of science is built, but it is simply one form of scientific practice – a very respectable form, to be sure, but it is unwise to justify substantial government investment in this type of research *solely* on the grounds of its potential longer-term benefits for technological and economic development (which it unmistakably has). It stands here in competition with other types of research, and it might even risk losing out in the long run. No, the justification for subsidising basic research should also be founded on an appreciation of the never-diminishing need of human beings to ask fundamental questions – driven by curiosity, by a hunger to know. This quest for fundamental understanding is, as it were, indelibly programmed into the human species. ‘To be always seeking after the useful does not become free and exalted souls,’ wrote Aristotle as early as 350 BC.<sup>2</sup> This maxim would better become the mission statements of the research institutions cited above than the implicit references they currently make to the economic profitability of the research efforts in fields of basic research.

Back to Stokes. His criticism is directed chiefly at the second characteristic of the standard model – its unidimensionality. The standard model leaves no choice: research must be positioned somewhere on a one-dimensional line running from pure ‘basic research’ to fully ‘applied research’. Every study must be located at a single point somewhere along that line. Research that pretends to contribute both to fundamental understanding *and* to the development of applications is neither fish nor flesh in this model, since it is positioned near the middle of the line and is consequently less ‘basic’ and less ‘applied’ than the ideal cases at the two extremes. Stokes, in contrast, has good reasons to assume that much, if not most, scientific research is not classifiable as either basic or applied research, and that particularly those studies that seek to substantially contribute to societal development can often also be

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<sup>2</sup> Aristotle, *Politics*, trans. Benjamin Jowett, (Oxford: Clarendon Press, 1963), Book VIII, 1338 b3.

labelled as basic research. In his analysis, Stokes cites the impressive work of Louis Pasteur in the field of microbiology as a perfect synthesis of the aims of ‘understanding’ and ‘use’. Pasteur strove to achieve a fundamental understanding of the bacteriological processes he studied, but he was equally interested in controlling the effects of those processes in humans and animals (Stokes 1997: 71ff). The unidimensional model, for its part, forces Pasteur’s research into a murky middle ground.

Against this linear model, Stokes posits a two-dimensional conceptual plane that does justice to research inspired both by the quest for fundamental understanding and by considerations of practical use and application.

*Quadrant model of scientific research*

source: Stokes (1997: 73)

Research is inspired by:

Considerations of use?

		No	Yes
Quest for fundamental understanding?	Yes	Pure basic research (Bohr)	Use-inspired basic research (Pasteur)
	No		Pure applied research (Edison)

The work of the theoretical physicist Niels Bohr typifies the upper-left quadrant: pure, basic research carried out with no practical aim, even though many applications were potentially there. On the lower right is the quadrant of pure applied research, exemplified by the work of Thomas Edison, who, as Stokes observes, restrained his employees from investigating the deeper scientific implications of the findings they made in their pursuit of commercially profitable electrical light. In Pasteur’s quadrant, we find research that both seeks to expand the frontiers of understanding and draws inspiration from practical considerations. In addition to Pasteur and others, Stokes cites here research by John Maynard Keynes and by the Manhattan Project.

The fourth quadrant is not empty, but is occupied, according to Stokes, by ‘research that systematically explores *particular* phenomena without having in view either general explanatory objectives or any applied use to which the results will be put, a conception more at home with the broader German idea of *Wissenschaft* than it is with French or Anglo-American ideas of science’ (Stokes 1997: 74, emphasis in original). This is the quadrant (if we may interpret Stokes in this way) of disciplines such as art history, which, in their focus on specific phenomena, are not primarily searching for the fundamental understandings referred to here, nor are they seeking any kind of practical application. Obviously this is a simplification. After all, interpretation, for example, often plays a significant role in describing artworks, while the results of the research can also be put to use for mediating purposes in the art world. Stokes himself cites *Peterson’s Guide to the Birds of North America*, which systematically describes the features and distribution of bird species, as an example of a worthy endeavour that neither pursues fundamental understanding nor envisages any direct application.

Now what help does this conceptual framework give us in understanding and positioning artistic research in the broad realm of research and development? Stokes devotes virtually no attention to the field of humanities, let alone discussing an often small-scale activity like artistic research. This does not, however, relieve us of the task of investigating what significance his model could have for the type of research we are discussing here. Although artistic research, as we have seen, operates on many of its fronts at a considerable distance from the practices and mores of ‘science’, the quadrant model can be interpreted in ways that can shed light on that synthesis of creative design, performative engagement, affective reflexivity and talent development which is so unique to the artistic quest. In artistic research, art practices are deployed methodologically in the research process, and in part they are also outcomes of the research themselves.<sup>3</sup> It seeks both to broaden our understanding of the world and of ourselves as well as to enrich that world by experimentally developing new artefacts: compositions, designs, choreographies, images, art installations. Artistic research is (to borrow Stokes’s words) motivated both by a ‘quest for fundamental understanding’ and by ‘considerations of use’. It therefore belongs to Pasteur’s quadrant.

In the *Critique of Judgment*, Immanuel Kant ([1790/93] 1978: § 53, 52) drew a distinction between pure aesthetic judgment and the judgment of art. Art judgment surpasses aesthetic judgment, because it focuses on the cultural value of artworks as well as on their

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<sup>3</sup> Borgdorff 2006.

beauty. That cultural value lies in their capacity to ‘leave [something] over for reflection’ and to ‘dispose...the spirit to Ideas.’<sup>4</sup> Although these principally undefined, but fundamental, ‘ideas’ are a different type of insights to the scientific explanations or interpretations obtained through ‘basic research’, they are no less fundamental. That is because, as we experience art, we articulate what it means to have *any* experiences, knowledge and understanding at all (to remain in the transcendental spirit of Kant). This is the reflexive nature of art; this is the engagement which is immanent in aesthetic distance. Hence, in addition to producing artefacts in the form of artworks and artistic practices, artistic research also generates fundamental ideas and understandings which, although nondiscursive as a rule, make the world into what it is or could be. Here lies the performative and critical power of research in the arts.

What is artistic research all about then? It is about cutting-edge developments in the discipline that we may broadly refer to as ‘art’. It is about the development of talent and expertise in that area. It is about articulating knowledge and understandings as embodied in artworks and creative processes. It is about searching, exploring and mobilising – sometimes drifting, sometimes driven – in the artistic domain. It is about creating new images, narratives, sound worlds, experiences. It is about broadening and shifting our perspectives, our horizons. It is about constituting and accessing uncharted territories. It is about organised curiosity, about reflexivity and engagement. It is about connecting knowledge, morality, beauty and everyday life in making and playing, creating and performing. It is about ‘disposing the spirit to Ideas’ through artistic practices and products. This is what we mean when we use the term ‘artistic research’.

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<sup>4</sup> Kant alludes to a quality of artworks which ‘...etwas zum nachdenken übrigbleiben läßt’, ‘den Geist zu Ideen stimmt’.

## Bibliography

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