

## Connections between Science and (Visual) Arts

Text: [Peter Tepe](#) | Section: [On ‚Art and Science‘](#)

*Abstract: The journal's main goal is to fully apprehend, delineate, and systematise the connections between science and the visual arts in a neutral way. Within this context w/k explores the relationship between art and science in general.*

### **Foreword: On the Structure of Taking Stock**

First something about the terms “science” and “art”. We count among the sciences mathematics, the natural sciences, medicine, social sciences, the humanities and cultural studies as well as philosophy; perhaps other disciplines will be added to the list at some point in time. Among the arts: literature, theatre, film, music, visual art, photography, architecture and dance. This division follows institutional separation which is currently quite common and which has emerged over the years: Sciences and arts are mostly taught and practised in different facilities.

The relationship between science and art is being re-examined more and more over the last years. One more frequently encounters statements and questions in texts such as the following:

“The relationship between art and science seems once again to have been set in motion. [...] Art is understood as science, science as art. The distinction between both seems to have lapsed – or is becoming blurred. Are art and science (or the sciences) becoming more permeable towards each other?”[\[1\]](#)

In such cases it should always be firstly explained what exactly the theses state; secondly they should be subjected to critical examination; and thirdly tenable statements need to be examined as to whether they in fact do invalidate the institutional separation actually existing between the sciences and arts. This important discussion has to mainly take place in the [Art Theory](#) field.

The main objective of *Connections between science and (visual) art* is to completely capture the connections between science and *visual* arts, distinguish them from each other and to arrange them in a neutral manner. In this context, however, the relationship between sciences and arts *in general* does become the object of reflection from time to time. The other forms of art are not at the centre of the investigation, but they are sometimes given a glance.

The investigation needs to be understood as a *work in progress* in two ways. On the one hand it will be *published in six chapters* from 2016 onwards; on the other it will be regularly updated and expanded afterwards in order to correct any mistakes and allow for the integration of new developments. Should users for example point out that a certain connection between science and art has not yet been considered, it will be included in the revised version. The same applies if ever it should happen that such a connection can be asserted more precisely and distinguished from the others more clearly than before. The users are invited to actively take part in the development of the *Connections between science and (visual) art* section.

*Individual* and *collective* science-art connections must be differentiated. An individual connection of this kind is present if an individual creates such a connection in his or her work. For this there are generally two possibilities with regard to the visual arts:

1. A visual artist deals with specific scientific theories and/or methods and/or results in his or her artistic work but is not, however, scientifically active. The online journal would classify him or her as a *science-related artist* and/or an *artist working with relation to science*.
2. An individual is active *both* in the field of science *as well as* in the field of art. The online journal would categorize such people as *border crossers between science and visual arts*. This denomination is not connected to any kind of judgemental value: It is necessary to refrain from the idea that due to their dual competence such a border crosser might be a *better* artist than someone who is an “artist-only” and/or a *better* scientist than a “scientist-only”. This does not, however, exclude the possibility of defending such a judgemental value in *individual cases*.

Science-related artists and border crossers do not only appear in visual arts but can be found in *all* forms of art. This is the first statement about the relationship between science and art *in general*.

One complex that requires closer examination is that of *artistic research* which is covered in more detail in Chapter 5. For the moment it is sufficient to say the following: In some cases “artistic research” represents the (visual) artists’ thinking and acting – which features no connections to science; in other cases the term will, however, denominate one form of science-related (visual) art or another in the sense of the definition provided above. Sometimes the demand is also made that scientific or science-similar findings be produced through artistic means. The second and the third variant are of prime interest for the online journal – the first will, however, also be considered in order to be able to establish clear distinctions.

Now we move on to the collective science-art connections. One such connection is present when there is

at least one scientist and at least one artist working together *within the framework of a specific project*. For now, there are two possibilities with regard to visual arts:

1. At least one visual artist participates in a *scientific research* project. One historical example is the participation of a draughtsman, painter or photographer on a scientific research journey.
2. At least one scientist participates in a *design project* which need not be referred to as being artistic in a stricter sense. This could be e.g. a construction project or a large installation that is dependent on scientific support.

Also to be allocated under these types of cooperation are

3. concepts of *aesthetic science*. Martin Tröndle understands it as being a “process that utilizes artists’ specific knowledge and competences in order to apply them to other contexts outside of the art system: Artistic competences and procedures are combined with those from science in order to generate new knowledge regarding certain problems. [...] Forms of perceptual insight in a scientific context in order to generate new knowledge [...] are crucial. [...] The production of a different knowledge that would not have been possible with solely artistic or scientific methods takes place as a social practice in the research process.”[\[2\]](#)

The [Art Theory](#) field features the critical discussion on whether the claim to be producing *new knowledge that could not have been gained in another manner* through a specific cooperation between artists and scientists can stand its ground under examination.

A special form of the connection between science and art of *all kinds* is constituted through the usage of artistic components and/or elements in teaching of sciences and/or in scientific publications. It is also necessary to differentiate between individual and collective use here:

1. One form of *individual* use of artistic components in these two scientific contexts is as follows: A scientist quotes passages from a poem, a story, a drama during a lecture or in a publication[\[3\]](#) in order to more easily illustrate his or her scientific argumentation by means of an example from another field. He or she could also use pictures or images of works from the field of visual arts, show photos or play music etc. to achieve the same. It is also possible that the presentation format as well as the structure of a scientific work can resemble the design of artistic forms.
2. There is a *collective* use of artistic elements in the scientific context e.g. if theatre elements are installed in a lecture. Such a performance might possibly feature the lecturer himself or herself as well as other people such as students, other lecturers or professional artists who are not connected to the university at all.

There is a transition area between individual and collective use of artistic elements which can include the case that the university lecturer has his or her students do e.g. a specific drawing or painting task in order to sensitize them to certain scientific questions.

One thing that needs to be distinguished from the usage of *artistic* components in science is the scientific recourse to *aesthetic* criteria in a wider sense of the word. Mathematics, for example – as well as other disciplines – tends to use phrases like theory A is more *elegant* or *beautiful* than theory B – and therefore *is the preferable one*. The online journal features a separate section for the examination of such contexts; cf. [The Programme](#), Section [Aesthetic Components in Scientific Research and in the Evaluation of Theories](#)

Connections between science and (visual) art is structured as follows:

*Chapter 1:* Border crossers between Science and (Visual) Art

*Chapter 2:* Science-related Art

The two first chapters focus on the two archetypes of the *individual* science-art connection. Artists working with relation to science are more common than border crossers. We will, however, start with the latter since they represent the more comprehensive phenomenon.

*Chapter 3: Cooperation between Scientists and Artists*

*Chapter 4: Artistic Components in Scientific Teaching and in Publications*

*Chapter 5: Artistic Research*

*Chapter 6: The Relationship of the Sciences to the Aesthetic Experience*

The chapter mentioned last is necessary since the *experience of the beautiful* – which e.g. is directed at scientific research results – precedes the sphere of art and can be misunderstood as being a connection between science and art.

One aim that is linked to my stocktaking of the different connections between science and art with the help of a typology is to improve the *use of language* in this context in the sense of language criticism that also affects the public. It is, for instance, common usage to speak of a *connection* or a *synthesis* between science and art. This is not wrong, but in cases concerned with the *identification* of the respective relations between science and art, it is *not clear enough*. If the typology is taken into account, much more precise statements can be made: For instance, the use of scientific findings for one's own artistic production is clearly a different kind of connection or synthesis of science and art from a fine artist's contribution to a scientific research project. The different types of connections or syntheses of science and art must not be lumped together. For the sake of identification, it is never sufficient to speak of artists and scientists *getting together*. To the contrary, the kind of collaboration needs to be determined as clearly as possible.

The typology is not linked to any predictions about the future development of sciences or arts. A speculative example will serve to illustrate what the typology can do and what it can't. Suppose, in 2050, an artist refers to a new scientific discipline developed in 2045 and uses its findings for their art. Today, no valid statements could be made about this presumed new science and its findings nor about artistic reactions to it. What we could say beforehand, however, is for instance: If the artist is only a recipient of the scientific findings, methods etc., but does not conduct any scientific research themselves, they can be categorized as being an artist working with relation to science and do not fall under any of the other forms of connection between science and art.

Translation: Don MacDonald.

Post picture above the text: Peter Tepe: *Verbindungen zwischen Wissenschaft und Kunst* (2016). Foto: Jens Helmus.

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[1] G. Gamm: *Vom Wandel der Wissenschaft(en) und der Kunst*. In D. Mersch / M. Ott (eds.): *Kunst und Wissenschaft*. Munich 2007, pp. 35–51, here p. 35f.

[2] M. Tröndle: *Zum Unterfangen einer ästhetischen Wissenschaft – eine Einleitung*. In: M. Tröndle / J. Warmers (eds.): *Kunstforschung als ästhetische Wissenschaft. Beiträge zur transdisziplinären Hybridisierung von Wissenschaft und Kunst*

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, Bielefeld 2012, pp. XV–XVIII, here p. XVI.

[3] This relates to lectures and publications which are not of an art historical nature in the widest sense of the word e.g. scientific seminars. Artistic phenomena are, in the widest sense, subject to research in the field of art history.

### Tags

1. Artistic Research
2. Border Crosser
3. science-related art