The Practice of Practice-led Iconic Research

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The approach of practice-led iconic research originated in the tradition of design and visual communication. It is often put into opposition to any research on images with an academic background or generally linked to the rather vague label of 'theory'. In contrast, this contribution argues that the outdated opposition of theory and practice is not adequate to conceive of practice-led iconic research. Rather, it should be understood as a specific research practice based on the production of images and aimed at gaining knowledge about visual communication and its specific pictorial means. All factors of image formation and the practice of design can become a subject of investigation. In order to characterize this kind of practice-led research and its usage of pictures, I compare it with theory-driven approaches and their respective use of picture examples as well as to the particular ways the natural sciences and artistic research engage with pictures.

keywords

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"Give a philosopher the concept of a triangle, and let him try to find out in his way how the sum of its angles might be related to a right angle. [...] Now he may reflect on this concept as long as he wants, yet he will never produce anything new. [...] But now let the geometer take up this question. He begins at once to construct a triangle."

(Kant, *Critique of Pure Reason*, ed. by Guyer/Wood, 631sq.)

Practice-led iconic research originated in the tradition of design and visual communication.[1] Whereas the common creative practice of a designer is to produce a graphical solution for a specific communicative task based on the designer's tacit knowledge, practice-led research explores the conditions, means, and procedures of the designer's creative practice. Practice-led research is not bound by a specific communicative task and its graphical solution, but takes the liberty to examine all the conditions, means and procedures of design practice. All factors that finally coalesce in the resulting pictures can become the subject of investigation, from the trained hand and body of the designer and their interaction with the different instruments to the characteristics of design instruments, of media, of well-established procedures of design and processes of graphical innovation, of handed-down pictorial traditions and formats.[2]

This emerging *research* field has to be understood as *practice-led* in at least three senses. First, as practice-led given its historical origins and institutional contexts because it arose from the practice of design and addresses questions within the practice of design. Second, it facilitates an understanding of design practice and can aim at improving it.[3]Third, this research deploys the practical competencies and the implicit knowledge of the designer.[4]Thus, it involves the production of images for the purpose of research, i.e., images that are instrumental in dealing with the questions in focus. As this research practice is based on "gaining knowledge about images through their creation"[5], it is furthermore characterized as image-based or *iconic* research.[6]

For the purpose of introduction to this special issue of *Visible Language*, the following considerations will characterize the practice of practice-led iconic research in comparison to other kinds of research on images or research using images. In the first section, I will specify practice-led iconic research in difference to studies on images with a background in academic disciplines like philosophy, art history, media studies or the history of science. I argue against the idea that practice-led iconic research can be conceived in opposition to 'theory,' a rather vague label used above all at the academies of art and design. Instead, I want to show that the outdated opposition of theory and practice is not suitable to grasp the way in which practice-led iconic research integrates theory and practice in a unified research paradigm and that 'image theory' or 'image studies' are themselves inherently based on specific image practices they take for granted. In the second section, I will specify practice-led iconic research by differentiating its employment of pictures from the usage of pictures common in natural scientific research as well as a form of research more akin to design: the widely discussed artistic research. Throughout, I will base my considerations on exemplary studies contained in this special issue of *Visible Language*.

1. The Practice of Practice-led iconic Research and Theoretical Approaches to images

The old opposition of theory and practice is based on the assumption that theory is to be understood as a theoretical reflection on a practice that implies a break with the same practice in order to reflect it from an external point of view. For example, the philosophy of knowledge regularly claimed to lay the grounds of knowledge gained by human faculties or scientific practice without presupposing those same faculties or practices. Yet, this claim is not only subject to philosophical criticism,[7] but seems to be historically outdated since in the 19th century the sciences began to develop their own methodological discourses whenever they ran into fundamental problems. The methodological reflection on concepts, procedures, and tools became an integral part of scientific practice so that the old claim that only a

1 The following thoughts on practice-led iconic research are primarily based on the long-term collaboration between the author, a philosopher and theoretician of images, and the Institute for Visual Communication at the Academy of Art and Design in Basel, its director Prof. Michael Renner, his research assistants and the contributors to the present volume. Furthermore, the following considerations refer throughout to Renner (2010, 2011, 2013, 2014).

2 Cross (2006), 101, proposes a helpful difference between three fields of design research: research in "designerly ways of knowing," in "practices and processes of design," in "the form and configuration of artifacts."These fields have some similarities with my explorative list of examples, but at the current state of my considerations, I want to leave open the question of a "taxonomy of the field of design research" (ib.).

3 As Candy (2006), 1, puts it, practice-led research is "concerned with the nature of practice and leads to new knowledge that has operational significance for that practice." How we conceive of the change that design practice undergoes by practice-led research is open to discussion. What some see as a means for a better understanding of practice means a fruitless academization or intellectualization of a craft or an art for others, cf. for example Schultheis (2005) and Joost (2016), 182-225. This question of evaluation I leave open to discussion.

4 Cf. Cross (2006) for a differentiated account of the knowledge of the designer. Mareis (2012) argues convincingly that the common reference to Michael Polanyi's 'implicit' or 'tacit knowledge' needs further discussion.

5 Renner (2010). 80.

6 Following Candy (2006), 1-3, practice-led iconic research would not be called 'practice-led', but 'practice-based research' that she defines by two aspects: 1. the research into a practice is primarily conducted by practitioners and 2. it is based on the produced artefacts: "If a creative artefact is the basis of the contribution to knowledge, the research is practice-based."We do not follow this terminological decision.

7 We find this type of critique of epistemology soon after its inception by Kant, for example in Hegel's well-known wording: "But to want to know *before* one knows is as incoherent as the Scholastic's wise resolution to learn to *swim, before he ventured into the water.*" (Hegel (2010), 38) And we find it today again, though in a very simple form, in so-called speculative realism.

theoretical reflection external and opposed to practice grasps the conditions of knowledge practices was put into question.[8]

Similarly, design research today tries to develop its own, self-sufficient methodological reflection relevant to the practice of design and deploying the competencies, procedures, and means engendered within the design practice. Put the other way round, a practice-led iconic research implements a theoretical reflection of its own embedded in practice instead of delegating it to an external discourse being the privilege of philosophy or other academic disciplines. Practice-led iconic research conceives of theory as part of its practice; it does not separate it from practice.

A further reason to not fall back into the opposition of theory and practice is the fact that this opposition only suggests a very simplistic understanding of practice but also of theory. Just as practice is not only the alleged dull occupation excluding any form of theoretical reflection, theory is not a distanced and airy reflection without its own implicit rules and embodied competencies. On a very general level, we can therefore argue that the opposition between theory and practice is obsolete because any theory has to be conceived as a practice of its own. After the practical turn, as Claudia Mareis argued,[9] or in the older pragmatist view, as I want to add,[10] it does not make any sense to oppose practice and theory. Already in the 1920's, John Dewey put forward the argument, »that the only distinction worth drawing is not between practice and theory, but between those modes of practice that are not intelligent, not inherently and immediately enjoyable, and those which are full of enjoyed meanings (Dewey 1929, p. 358). Dewey's argument is methodologically helpful, even if we skip the question how he differentiates intelligent and enjoyable practices from the others. This suggests conceiving practice-led iconic research not by the outdated opposition between practice and theory, but by characterizing it as a specific practice.

Assuming this point of view, it is helpful to characterize practice-led iconic research in comparison to theoretical research practices common in philosophy, art history, media studies, or history of science where they conduct research on images. These disciplines are, in the context of the academies of art and design, often subsumed under the vague label of theory and thereby put into opposition to the practice of design and design research. Media studies and the like build image theory on specific practices of historical research, academic discourses, or aesthetic experience: choosing examples within a specific domain of images, such as the history of the arts, the realm of scientific visualisations, the icons of popular culture, etc.; contextualizing them in respect to the technical conditions, the materiality of the pictures, the development of forms of representation, and so on; interpreting and comparing them in order to embed them in the narrated history or the ongoing train of thought, etc. Even if we do not take into account the practice of theory as such – reading, note taking, thinking, discussing, writing, publishing, and so on[11] –, but restrict ourselves to observing the different ways in which the various approaches make use of pictures, it seems to be clear that theoretical approaches to understanding images are intertwined with specific image practices. Nevertheless, practice-led iconic research distinguishes itself from image research approaches in other academic fields: it produces pictures which are instrumental in treating the questions it explores.

A good example is Helga Aichmaier's research on the documentary photographic image included in this volume.[12] Since its invention and triumph in the 19th century, photography has been linked to documentation. It was evident that the role of the person taking the photograph is of less importance compared to that of a painter, so that the idea came up that any photograph is an objective trace of reality necessarily documenting the things whose radiation helped to produce it.[13] In the ongoing debate, we find many opposing claims, for example, Hubert Damisch's argument that the photographic process must not be confused with a natural and causal process, because it is part of an invented technique embedded in a culture and imbued with its norms;[14] or Peter Geimer's demonstration that the theory of the trace presupposes the functioning or the technique and omits all the possible accidents, due to the recalcitrant materials and the mediality of photography;[15] or Philippe Dubois' highlighting of the irreducible factor of the photographer's decisions how to take a shot,[16] etc.. However, all of these so-called theoretical approaches illustrate their stance through pictures taken from the history of photography. In contrast, Helga Aichmaier deals with the same question by taking photographs herself. The whole debate about the documentary photographic picture is reframed from the perspective of the practitioner. Instead of discussing the claim of whether and why photography as such is documenting reality, Aichmaier poses the question of how to make a photograph that will be regarded as a documentary picture by most viewers. For this purpose, she specifies a type of object to be photographed, i.e. public places, and decides to explore four places, in Basel, Glarus, Vienna, and Linz. Furthermore, she defines parameters of

8 For sure, the sketched border between internal and external reflections is fuzzy and blurred, but it is nevertheless not needless to characterize different forms of concomitant reflections in general and the practice-led iconic research in particular.

9 Cf. Mareis (2016), 35-41, esp. her conclusion 40.

10 For sure, this is not the first time that Dewey is introduced into this discussion, cf. for example Findeli (2016), 28.

11 Cf. Hoffmann (2008, 2010); Trüper (2007); Schubbach (2016), 40-50 and 246-254. Initially, it was note taking in the natural sciences that triggered this kind of research, cf. Hoffmann (2003) and Rheinberger (2003, 2006).

12 Cf. Aichmaier's contribution in the present volume pp. ##

13 In this respect, the possibly most debated Barthes (2000) seems to be no more than an elegant reprise of thoughts haunting photography since its invention; cf. in respect to the scientific applications of photography Daston/ Galison (2007), 121sqq.

14 Cf. Damisch (1978).

15 Cf. Geimer (2000, 2010).

16 Cf. Dubois (1998).

the photographic process that she will vary while taking the photographs of each public place. The subsequent systematic exploration yields a rich collection of photographs that can be arranged and assessed in view of the question dealt with. As a result, it becomes evident that a lot of shots do not conform to our expectations of a documentary photograph, whereas others suit them.[17] Due to the systematic variations, we can understand which parameters are most important and can specify the range of each parameter adequate for the genre of documentary photography. Beyond that, we could explore a range of marginal cases that are possibly interesting for creative innovations of the genre.

In sum, practice-led iconic research deals sometimes with the same questions addressed in theory-driven studies but takes a new turn as the practitioner's perspective is introduced. Instead of dealing with question by selecting and interpreting given pictures, practice-led iconic research produces pictures in order to deal with the questions. For this purpose it deploys basic image-making techniques and competencies used in design practice. It produces images by "a systematic approach to generate visual variations"[18] by defining and modifying specific parameters of image production, it compares and assesses the pictures, and identifies image parameters and their ranges most relevant for possible answers to the questions dealt with. Consequently, the pictures are used here as a probe in order to explore the space of possibilities and the specific factors of picture formation.[19]

Usually, practice-led research produces pictures, whereas studies with a theoretical background make use of selected scientific, artistic or popular pictures. Nevertheless, it can be the case that a theoretical approach includes pictures produced for this special occasion or that a practical approach takes recourse to already existing pictures. But, these selected pictures function differently in the context of a practice-led iconic research than in a study with a theoretical background. If pictures of art history or the history of sciences are picked up in the context of practice-led iconic research, they are considered and assessed in view of their variations and possible alternative formations. Although in fact, they are given, they are imagined as latently made and related to possible alternatives, as Paloma Lopez shows in her contribution to this volume.[20] Consequently, the usage of given pictures in the context of practice-led iconic research is different than their role within image studies in art history or history of science.

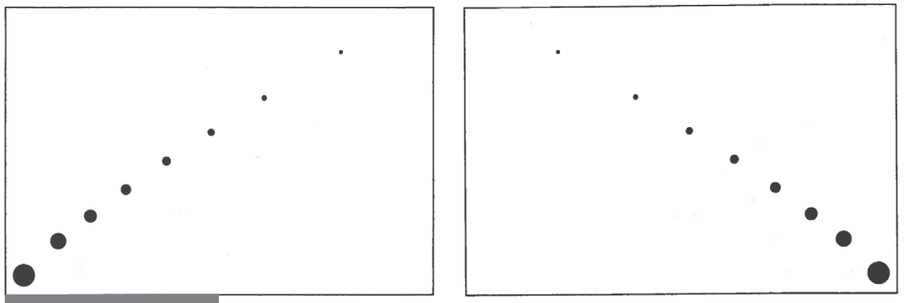
We can observe a similar difference the other way round. Where studies in image theory not only use pictures they find in the history of the arts or the sciences, but occasionally also involve pictures specifically made

17 In a way, Aichmaier thereby explores from a practitioner's point of view the theoretical difference between a photograph referring, but not necessarily showing a black horse and a picture showing (but not necessarily referring to) a black horse already introduced by Goodman (1976), 29.

18 Renner (2010), 81.

19 It could be tempting to speak here of 'experiments', but the question of whether and in what respect the procedures of practice-led iconic research are comparable to what we call experiments especially in the natural sciences would need a much deeper analysis and more detailed discussion, cf. for some inspiring thoughts on this question with reference to artistic research Rickli (2015).

20 Cf. in the present volume. For some further theoretic reflections on the relation between seeing images and their making, cf. also Schubbach (2008).



Figures 1 and 2

for this purpose, the usage of these pictures nevertheless differs of the work with pictures in practice-led iconic research. For these pictures are not systematically produced in order to explore a range of parameters of image formation. Instead, they are, for instance, sometimes used in art history to schematically modify the composition of an artwork and to illustrate the specific choice of the artist and its effects.[21] Or, they are at times included to produce evidence for an image theoretic argument, as for example in Gottfried Boehm's "Bild und Zeit" from 1987. In contrast to the widespread belief that we see only what is present when we see pictures and that we therefore do not experience time for as long as the pictures do not start to move, Boehm argues that time is "*the* basic category of painting"[22]. As evidence, Boehm presents, apart from some well-known art works, two abstract representations of black circles beaded on an invisible, slightly curved line and becoming larger or smaller along that line (*Figure 1* and *Figure 2*). These pictures are introduced into the text as a "graphic demonstration (*anschauliche Demonstration*)"[23] of the fact that we immediately see the movement of a circle. This demonstration involves the reader and viewer of this article and evoking the "fundamental experience of temporality of images"[24] emerging from the interaction of the pictures and the viewer's eyes.[25]

This usage of pictures within a theoretical consideration differs heavily from the work with pictures within practice-led iconic research. Firstly, pictures are introduced into the text in order to illustrate a theoretical analysis and not to explore a range of possible alternatives to the same communication task. Therefore, the production of the images is not even mentioned, let alone the question of how they were made and why in this particular way. From the methodological standpoint of practice-led iconic research, these pictures could be the starting point of a systematic production of pictures, including the variation of the distances between the circle, of their enlargement or downsizing, or of the harsh black-white-contrasts, in order to explore this way of depicting movement within a stable image, to specify some of its parameters and to determine the effects of choosing these parameters within specific ranges. Secondly, the pictures are sup-

21 For an outstanding example, cf. Imdahl (1980).

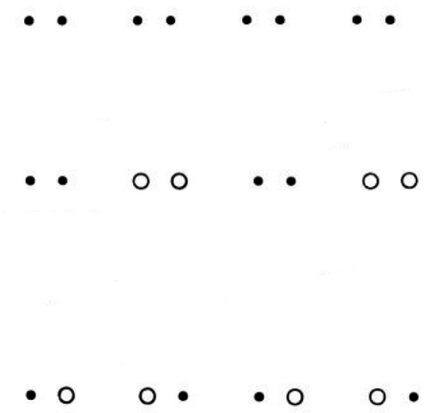
22 Boehm (1987), 3, my translation.

23 Boehm (1987), 22, my translation.

24 Ibid.

25 Cf. Boehm (1987), 7-12 and 20-22.

Figures 3



posed to produce evidence within both approaches, but the function of evidence is of different nature in each case. Whereas in the case of Boehm's "Bild und Zeit" the pictures shall evoke the experience of a temporality arising between the picture and the viewer's eyes, studies in practice-led iconic research address the viewer in order to assess which pictures and parameters under consideration have effect, thereby making the different possibilities of image formation evident.

In this respect, viewers' experience of pictures in practice-led iconic research is comparable to experience of pictures in the canonical texts of gestalt theory.[26] First and foremost, Gestalt theory researched the laws of seeing and the structuring principles of our visual field. For this purpose, researchers like Max Wertheimer, Wolfgang Köhler, or Albert Michotte[27] used visual stimuli in their experimental practice, but also included some of them in their texts. Therefore, these texts did not exclusively summarize the results of this experimental practice, but also enabled the readers to reenact the experiments to a certain extent. Readers and viewers can thereby experience the evidence of specific principles determining the visual relations he or she realizes and the figures he or she sees. For example, Max Wertheimer, in his "Untersuchungen zur Lehre von der Gestalt" (1922/23) uses pictures to demonstrate how a series of dots is seen as a couple of pairs of dots due to the two independent factors of closeness and sameness (*Figure 3*).[28] In the first series of dots, we tend to see four pairs instead of a series of eight dots because of the varying distances. In the second series, this effect is even intensified through using two different types of dots, i.e., small filled circles and larger empty circles, for each pair of dots. In the third series, this sameness of two types is used in contradiction to the spatial closeness making the viewer realize two different pairings, the one pairing of the close dots of different type or the pairing of the same dots in contradiction to the closeness to dots of the other type. Thereby, the pictures illustrate two principles structuring our visual perception and enable the reader to experience their effects and possible conflicts.

As a part of the text, these pictures involve the reader as a viewer in order to provide visual evidence for the asserted results of this research. At the same time, they mirror the role of visual stimuli within the experimental practice of Gestalt psychology. This practice was very often centered on a test subject exposed to the visual stimuli and reporting what he or she actually sees. By including numerous illustrations into their publications, the Gestalt psychologists not only enable the reader to comprehend the results they achieved but also enable the viewer to at least partially reenact the substantiating observations of the test subjects. It is for this purpose, that Gestalt psychologists composed texts permeated with illustrations producing evidence for their results.

We can see herein an important parallel to the usage of pictures within practice-led iconic research, but the role of pictures is here even more important. For example, the pairs of pictures we find in the contribution of Claire Reymond let the reader and viewer experience the asserted insights into the formal characteristics provoking a semantic interference between two pictures presented as a pair.[29] Yet, this usage of pictures in publications is not a mirror of a self-sustaining experimental practice, as is the case in gestalt psychology. Rather, images in practice-led research invite all readers to reproduce the insights gained first and foremost by the researcher's eye thus making an exchange between researchers and the readers of the publications. For practice-led iconic research, these critical assessments of the asserted evidences are at least as good a basis for forming hypothesis and delving into more comprehensive endeavors that could make us of – where it is appropriate – as are the empirical surveys and quantitative methods of psychology.

2. Picture Making in Practice-led Iconic Research, Scientific Visualization Practices, and Artistic Research

In the last paragraph, I tried to characterize practice-led iconic research by considering it in contrast to research on images in the history of art or history of sciences, media studies or philosophy. To include further aspects of practice-led iconic research into the picture, I want to consider two other forms of research linked to the use of pictures: the visualization practices in the natural sciences and the widely discussed artistic research.

26 Boehm's pictorial evidences also open up this link to gestalt psychology because they are put in context with Paul Klee's "Das bildnerische Denken" and Wassily Kandinsky's "Punkt und Linie zur Fläche" – cf. Boehm (1987), 8 –, both of which have to be seen in the context of evolving gestalt psychology and the imagery linked to it and its 'forerunners', cf. Teuber (1979), with focus on Klee, and Van Campen (1997), 134sq., with regard to Kandinsky.

27 On Gestalt psychology, cf. Ash (1995), on the lesser known Albert Michotte especially Leyssen (2013).

28 Cf. Wertheimer (1923), 312. I only show the first three pictures of Wertheimer's much longer series. Cf. Pratschke (2016), esp. 19-29, for a sketch of the historical background of Wertheimer's imagery.

29 Cf. in the present volume.

To compare the employment of pictures in practice-led iconic research and the practice of visualization in the natural sciences is hardly a feasible endeavor. The practices of scientific research are too manifold and the role of pictures too diverse for a general comparison to be possible. Nevertheless, we can take out some aspects of the many studies devoted to the role of visualizations in the natural sciences. A first important difference is that the natural scientists are not as design researchers primarily interested in pictures as such, but they are using pictures for visualizing objects or data in order to comprehend better their object of inquiry. Therefore, the relation to the depicted object or situation is indispensable for the imaging practice in the natural sciences. This does not necessarily imply that the visualizations are reduced to sheer imitations or copies of reality. Visualization techniques do not represent what we already know, they are supposed to visualize what we do not know. For that purpose, stable relation of the pictures to what shall be depicted has to be carefully established. This includes the task of drawing a difference within the pictures, namely, between aspects which can be understood as showing something 'real' and other aspects which are effects of the technique itself, the materials involved or simply defective results. At this stage of development, a visualization technique and the pictures it produces are itself objects of research, as for example photography when it was first applied in the natural sciences,[30] or the scanning tunneling microscope when it had first been developed in the 1970s and 1980s.[31]

The expectation that scientific visualizations would bluntly show things as they are can only come up when a visualization technique is already established, when its technical apparatus is hidden in a black box,[32] the visualizations are standardized in form, colors, etc., and the eyes are trained to interpret the new pictures[33]. Then we do not draw the difference between the referential and the reflexive aspects of the pictures consciously, but rather it seems to be drawn and given by the picture itself.[34] Hence, the technique can be embedded in experimental settings aiming at new and other questions or can find widespread application in medicine, industry, etc. Nevertheless, new questions concerning the visualization technique can arise at any time so that the visualization technique again becomes an object of technical inspection and possible research as well as the credibility

30 Cf. Hoffmann (2001, 2002); Geimer (2002), 327-341; Schubbach (2013), 620-627.

31 Cf. Hennig (2011).

32 On 'black boxing' cf. Latour (1987), 1-4, and his theoretical account of this process ib., 128-132; cf. also Rheinberger (2006), 28-31, who describes the black boxing as the transformation of an epistemic into a technical object in order to highlight the persisting possibility that every technical object can become an epistemic object again.

33 Cf. Fleck (1986).

34 Gugerli/Orland (2002), esp. 9-12, describe and analyze these processes as "normalization" of scientific and technical visualizations.

of the pictures and their forms subject of scrutiny.[35]

Therefore, we have to differentiate two conditions of scientific visualization practices that sometimes are hardly distinguishable. First, we have the condition of established practices, when the technical apparatus is black boxed and the pictorial outputs are highly standardized. From that first condition, the pictures seem at least for the educated eye to immediately provide evidence for what they refer to or what they verify, whereas the pictures and their making are rarely subject to scrutiny.[36] Second, we have the condition of techniques still in development when besides the form of pictures the technical process of their making and the possible reference of the output is still not clear. According to this second condition, pictures attract more attention because they still need to be established what they show. The form of depiction has to evolve, a fact that is often overlooked compared to the stabilization of the technical processes, because professional designers are rarely involved in this state of development.[37]

However, in the context of this article, it is not decisive whether designers are involved in the development of scientific imagery. Rather, it is illuminating to compare the scientific visualization practice in its evolution and the use of pictures in design research in general and practice-led iconic research in particular. In the natural sciences, the development of pictorial representation forms is rarely professionalized. Nevertheless, it is linked to a highly elaborated but implicit reflection on the shaping of the pictures that respect different audiences, that fit the sober, informative and objective schemes for the scientific communication of results, that create more attractive and eye-catching designs for persuading other scientists of a new approach, and that sometimes produce spectacular and sensational views for funding organizations and the broader public.[38] The evolvement of forms of pictorial representation in the natural sciences is highly differentiated given the diverse aims of communication, but it is, in general, aiming at specific purposes: representing scientific objects and information, persuading of colleagues or drawing attention in the broader public. Therefore, the usage of

35 Cf. Hennig (2011), 170-192, with respect to the asserted, but deceptive visualizations of the DNS-molecule by scanning tunneling microscopes around 1990, and Rasmussen (1993) with the fascinating example of the organelle called 'mesosome' that was an object of flourishing research in cell biology during the 1960s and 1970s – until it was finally considered to be an artifact produced during the complicated preparation of the cellular probes for electron microscopy.

36 To say that the pictures of an established and black boxed visualization technique are rarely subject of scrutiny in daily practice does, for sure, not exclude that the interpretation of these pictures and the imaging practice as such has its own complexity. Cf. for example Burri (2008), esp. 89-257, with focus on the daily practice of MRI in medical care.

37 This differentiation of visualization practices is linked to the often neglected difference of cutting-edge scientific research on the one hand and the established knowledge of a science taught by textbooks. This difference has to be kept in mind when we discuss practice-led iconic *research*, as Dombois (2005) already stresses.

38 Therefore, Hennig (2011), 277sq., summarizes his detailed analysis of the early visual practices linked to the scanning tunneling microscope by characterizing it as an "implicit science of the image" (my translation).

the pictures is characterized by the pragmatic aims of scientific practice. The pictures as such and the ways of their formation are black boxed.

In contrast, practice-led iconic research unboxes techniques of visualization and means of visual communication to make explicit and to understand better the pictorial means which are used in image practices in general and in design in particular. For example, Susanne Kaeser's contribution to this volume explores the general possibilities to show the development of a construction site that she documented photographically in an earlier project.[39] Instead of rigging up a solution on the basis of the given material, the practical, but implicit knowledge of an educated designer within a specific tradition of design and against the backdrop of her own individual experience, she enters into the question in a systematic fashion and specifies the approach by using the given photographic materials and arranging it in a series of pictures. Series of pictures were used for a long time in the sciences as well as in the arts,[40] but they were at least to my knowledge never systematically examined, as is done by this exemplary study of practice-led iconic research.

Given the 70 photographs of one construction site on the banks of the Rhine made from 2010 to 2016, Käser explores the possibilities how to document and visualize the development of the building process in a series of pictures. As the primary aim is to document, she sticks to non-invasive methods. The first, most basic steps, were the selection of a few pictures to be arranged in a series. Using approximate subdivisions of the six years of construction, the series of two, three, six and twelve pictures make evident that neither too few nor too many pictures make visible the development that shall be documented, albeit on different grounds: Whereas the series of two or three pictures do not show a development, because the two or three states within time are too isolated in order to coalesce into one process, the twelve pictures exceed our capacity to synthesize the many different states within time into one temporal process. Hence, it is reasonable to base the further examination on series of six pictures.

Nonetheless, it turns out to be a non-trivial task to select the six pictures that are most appropriate to document the development. To stick to objective time and to choose the pictures taken at dates dividing the construction process into regular intervals does not produce a very convincing result. In order to see a temporal process represented in a series of photographs, our eyes must be able to easily identify some objects as well as their continuous change in the consecutive pictures. The construction site apparently did not develop continuously, but in a specific rhythm combining longer phases during which the visible changes were minor and others through which a lot of changes became visible in short time. Yet, the

39 Cf. in the present volume.

40 Cf. Wellmann (2010), 197-369, with a focus on the embryology emerging around 1800 and its visual representation of development.

objective division of time is not expedient where we want to document non-continuous, abruptly changing processes, because a series of photographs that were periodically taken do not represent a temporal process for the human eyes. Therefore, Käser chooses such pictures that provide the human eyes with what they need in order to see a development of the construction site: the objects they can easily identify in two consecutive pictures and the change of these objects like the demolition or the construction of a building in progress. Given the aim that the construction process shall be displayed in a series of photographs, the demands of the eyes have to determine the selection of pictures – and not the objective measures of time. As a consequence, this form of documentation has to pay a price, because it does not show the sometimes abrupt rhythm of the real process, but a smoothed out, regular development of the construction site.

Consequently, the first interim result is that the pictures have to be chosen in such a way that the eyes can identify some objects between each subsequent picture and at the same time see the change and the differences that occur. But a further observation shows that a lot of differences between subsequent pictures are not linked to the construction process. All the photographs were taken, as far as possible, with the same photographic parameters, but the shots are nevertheless surprisingly different due to the changing weather conditions modifying the light situation, shadows, and reflections, or the colors of the objects as well as the Rhine. The technical medium of photography indifferently registers everything, so that successive pictures exhibit a lot of differences that are not at all essential to the development to be documented. Hence, the indifferent registration by the photographic apparatus does not produce a good documentation of the construction process in a series of photographs even if each photograph would indeed be an immediate trace of reality, as was often speculated in the theory of photography. Consequently, it makes sense to select only pictures with similar weather and light conditions, what seems to be impossible given the available pictures. Accepting the fact that these differences are accidental in respect to the process to be documented, it is reasonable to modify the pictures and, thereby, to take the next step in this practice-led iconic research, i.e. not only to select pictures in view of the representation of the construction process for a human eye, but to digitally manipulate them in such a way that the accidental changes are eliminated, and the essential changes are highlighted.

In the following picture series, Susanne Käser explores the question of how to cautiously manipulate some aspects of the photographs, like the Rhine, the sky or the color scheme, in order to produce a series of pictures making evident the development of the construction site. The result that manipulations which suppress too many accidental differences are not working because the eyes are irritated by a too comprehensive identity

of pictures, is highly interesting. The eyes presume to see identical copies instead of the development to be documented. Obviously, there needs to be some, but not too many, accidental variations between the pictures in order to avoid this awkward impression and enable the eyes to realize the development exhibited by pictures similar as well as different enough. I do not want to examine Käser's study into more details, but rather want to highlight the aspects of practice-led iconic research that her work exemplarily demonstrates.

As in the case of Aichmaier's contribution to this volume, Käser's study deals with the question of documentation in photography from the perspective of production. In this perspective, it becomes immediately evident that a credible documentation cannot be assured by the mere application of a technical medium like photography. Instead, a lot of conventions have to be observed and a whole set of parameters to be chosen in such a way that they are adequate for the genre of documentation and the expectations linked to it. Concerning Käser's photographic series, it becomes furthermore evident that the indifferent registration does not convey any documentary evidence, but irritates and counteracts this aim. Therefore, Käser explores ways of how to modify the photographic material, how to chose the best shots, how to digitally manipulate them in such a way that differences and similarities are in the right balance to enable the eye to realize the development documented in a series. For this purpose, it is necessary to try, to specify a selection of parameters, to produce different series and to observe their effect. Some observations reveal surprisingly unforeseeable dead ends; others prove to be seminal and hint at possible solutions. Thus, Käser's study explores a range of possibilities for documenting developments in photographic series and demonstrates viable solutions for this task.

Perhaps, every designer confronted with this task would have undertaken a similar exploration, whether he or she had heard anything of design research or not. The fundamental difference is that practice-led iconic exploration shifts from making images to communicate, to making images that make explicit the knowledge engendered by the everyday design practice or produce further knowledge beyond this practice. For this aim, practice-led iconic research transforms the everyday design practice into a "research-led practice"[41] aiming not at the ad-lib solution of the given task, but producing knowledge about the possible ways of finding a solution as well as about the helpful instruments and the necessary conditions. Hence, practice-led iconic research has to systematize and to document the explorative work with images, to observe and describe step by step the effects of an attempt, to draw the difference between passable and impassable ways, to justify this decision, and to provide the visual pieces of evidence for them. In this form, design practice implements its own reflection and for this purpose deploys the competencies it engenders and the means as well as procedures upon which it is based. Thus, it makes explicit, collects and at the same time produces "knowledge" that, following Linda Candy, "has operational significance for that practice."[42]

Obviously, this practice-led iconic research has a particular systematic and institutional proximity to artistic research. Both are embedded in a creative visual practice and aims at gaining knowledge by producing artifacts. Both deploy for this purpose all the competencies, procedures and materials common to their respective creative practice. But artistic research adheres to the traditional aims of the artistic practice: "the prime focus in artistic research is on concrete creative practice. The research aims to make a substantial, preferably cutting-edge contribution to the development of that practice", as Henk Borgdorff sums up.[43] Gaining knowledge by way of producing pictures is not the priority of a transformed artistic practice, but mostly considered as a side-effect of producing convincing artworks.[44] Hence, artistic research seems to be an integral part of the production of the artwork that finally 'embodies' as well as communicates the knowledge gained during its production.[45] Consequently, the need to accompany the artwork by a linguistic reflection is frequently renounced.[46]

On the other hand, practice-led iconic research uses pictures to explore the possibilities of image formation relevant to the research question. Therefore, a study in practice-led iconic research will include visual documentation and will complement it with a verbalization that describes the produced visual evidence, justifies the decisions, and may suggest possibilities to explore further. The question whether the pictures are aesthetically pleasing or not, whether they are new and creative visual solutions of a task, is not of primary importance. The immediate aims of art research

41 Smith/Dean (2009), 7, speak of 'research-led practice' in a different way. By this wording, they want to hint at the fact that "scholarly research can lead to creative work." In contrast, I want to highlight the transformation of a creative practice effected by suspending the aim of producing aesthetically innovative and convincing artifacts in a broad sense, like in art and design, and replacing it by the new aim of gaining knowledge, like in practice-led iconic research.

42 Candy (2006), 1.

43 Borgdorff (2011), 49. This text gives a good overview of artistic research – as well as Busch (2014).

44 That's why it is a common position in the debate on artistic research – in difference to the case of design research – that any artistic practice includes and essentially is artistic research, cf. for example Becker (2009), 79sq., and, in contrast, Carduff/Siegenthaler/Wälchi (2010), esp. the preface ib., 12-17.

45 Already for Frayling (1993), 5, research in art *and* design is ultimately embodied knowledge: "Research where the end product is an artefact – where the thinking is, so to speak, *embodied in the artefact*, where the goal is not primarily communicable knowledge in the sense of verbal communication, but in the sense of visual or iconic or imagistic communication." Also for Borgdorff (2006), 23, it is essential to research in the arts to "reveal and articulate the tacit knowledge that is situated and embodied in specific artworks and artistic processes." Cf. similarly Borgdorff (2011), esp. 59sq., and for a harsh critique of this claim raising a lot of substantial questions Scrivener (2002). For a more balanced and nuanced discussion of the role of the artwork and the process of artistic research cf. Smith/ Dean (2009), 5-7, or Borgdorff (2006), 17-19.

46 Cf. the annoyed critique of regulations that a PhD-thesis in artistic research has to accompany the produced artwork by a written thesis in Candlin (2000).

and practice-led iconic research are not the same because only the latter transforms a creative into a research-led practice which primarily aims at producing knowledge.

Practice-led iconic research explores the conditions of the design practice as well as the possibilities of image formation in a systematic way. For this purpose, it suspends the common standards and immediate aims of design practice. It is free to explore unnoticed and unusual approaches that may have productive and creative potential for a future design practice. In order to create an impact, it is still crucial for the evolving field of practice-led iconic research to establish forums of collaboration and discussion, forms of publication and critique.[47] The practice of practice-led iconic research needs to become not the occupation of individual researchers, but as any academic practice, a social endeavor of involving people and creating spaces for encounters as well as collaborations. Seen against this backdrop, the present issue of *Visible Language* is just one more step in the evolvement of this new research practice.

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47 At this important aspect hints Dombois (2010), 83sq., with regard to research in the arts.

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