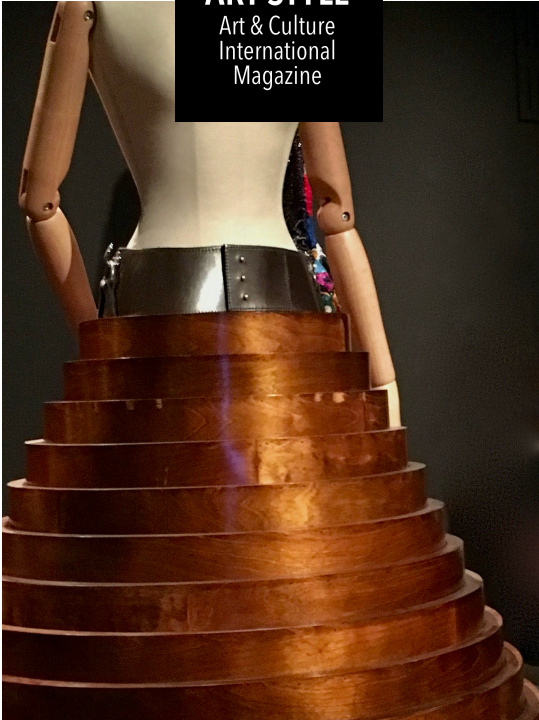# Material Image

Affordances as a New Approach
to Visual Culture Studies

ART STYLE
Art & Culture
International
Magazine

Cover photo: Detail of *Coffee Table Skirt Hussein Chalayan,* by Manuelarosi. February 6, 2017. Licensed under CC BY-SA 3.0.

Art Style | Art & Culture International Magazine is an open access, biannual, and peer–reviewed online magazine that aims to bundle cultural diversity. All values of cultures are shown in their varieties of art. Beyond the importance of the medium, form, and context in which art takes its characteristics, we also consider the significance of socio-cultural and market influence. Thus, there are different forms of visual expression and perception through the media and environment. The images relate to the cultural changes and their time-space significance—the spirit of the time. Hence, it is not only about the image itself and its description but rather its effects on culture, in which reciprocity is involved. For example, a variety of visual narratives—like movies, TV shows, videos, performances, media, digital arts, visual technologies and video game as part of the video's story, communications design, and also, drawing, painting, photography, dance, theater, literature, sculpture, architecture and design—are discussed in their visual significance as well as in synchronization with music in daily interactions. Moreover, this magazine handles images and sounds concerning the meaning in culture due to the influence of ideologies, trends, or functions for informational purposes as forms of communication beyond the significance of art and its issues related to the socio-cultural and political context. However, the significance of art and all kinds of aesthetic experiences represent a transformation for our nature as human beings. In general, questions concerning the meaning of art are frequently linked to the process of perception and imagination. This process can be understood as an aesthetic experience in art, media, and fields such as motion pictures, music, and many other creative works and events that contribute to one's knowledge, opinions, or skills. Accordingly, examining the digital technologies, motion picture, sound recording, broadcasting industries, and its social impact, Art Style Magazine focuses on the myriad meanings of art to become aware of their effects on culture as well as their communication dynamics.

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Christiane Wagner
Editor-in-Chief and Creative Director

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Editorial

Dear readers,

Welcome to our current issue of *Art Style, Art & Culture International Magazine*! We are celebrating our second year of editions. Since our special edition celebrating the first year of publications in March 2020, we have been following the cultural and artistic transformations in their challenges as they face this pandemic, which our most recent generations never imagined they would experience. The challenges that humanity is confronting, which undoubtedly also impact the arts and culture, reflect moments of great uncertainty, insecurity, and especially fear and despair. However, how does one overcome all this if not by learning through the history of humanity and the arts? Indeed, without the references of our past through mythologies, tragedies, epics, and narratives of the Greek, Roman, and Christian worlds, from the Middle Ages to the Renaissance and Modernity to our times, nothing could provide as much meaning to life as all the ways in which we imagine and configure it based on arts, culture, and knowledge.

The history of art and literature has shown how humanity, in its cultural diversity, is influenced by images and narratives that impose the perception of their meanings, understandings, and cultural identities. However, the arts' importance is even more significant when they provide us with the means to overcome many of the problems we face in our society, beginning in our oldest civilizations. Thus, what matters most is their reception by the public. In this sense, the arts and their audience represent an essential singularity. In this mutual relationship, great works take time to transform, overcome, and illustrate new horizons, hope, imaginings, and dreams. In its relationship with the public, with the people and their idiosyncrasies, art shows its power to change through the creativity and talent of visionary artists attuned to the spirit of the times. No matter how often the human and social sciences have dedicated themselves to understanding and analyzing the universe of the arts and human capacity in its sensitive faculties, even through theories and methodologies, what remains is to understand human nature. Beyond the limitations of this understanding, it is worth remembering that the real pleasure is still in the experience that each person finds in a painting, book, photograph, film, music, theater, dance, fashion, design, and, in short, a favorite art form. The freedom to create is equal to choosing one's appreciation, above any aesthetic references, because taste can be both subjective and universal; what matters is the possibility of communication between those who share the same interest (Kant). However, in this current scenario, we cannot stop acknowledging that the material aspects – in other words, the economic factors – are essential for art and culture to remain alive and thriving through sensitivity and creativity. Furthermore, when we think of our academic goal, *Art Style Magazine* has operated with the support and collaboration of academics and non-profits who are willing to contribute to the editorial work, dissemination, and promotion of the knowledge on art and culture.

Therefore, this support brings the essential notions that underlie visual culture to the interested public. In this sense, the journal has received academic colleagues' proposals to participate in issues as guest editors to develop themes that meet the journal's profile and are relevant to an international publication. Thus, from this second year of publications on, guest editors have demonstrated a collaboration and willingness to work with our Editorial Team as co-editors on special themes. With the growing demand from academic colleagues to participate in the editions and enable those interested, *Art Style Magazine* will publish on its website the guidelines for guest editors, following the Wiley and COPE recommendations for publishing best practices and guidelines. The goal is teamwork, considering the collaboration of the respective colleagues in their knowledge and skills.

Another significant issue is that to achieve *Art Style Magazine*'s goal of being part of the best indexers, besides considering a cycle of at least two years, it is necessary to meet other requirements. Among the required actions is to protect the magazine and link to the best repositories. Thus, to safeguard and promote *Art Style* Magazine's publications, we have already secured all issues using the Zenodo and Core repositories. With Zenodo, "researchers can receive credit by making the research results citable, through OpenAIRE integrating them into existing reporting lines to funding agencies like the European Commission. Citation information is also passed to DataCite and onto scholarly aggregators." The origin of the name Zenodo is in "Zenodotus, the first librarian of the Ancient Library of Alexandria and father of the first recorded use of metadata, a landmark in library history." *Art Style Magazine* is also deposited in CORE — Open Access for the Humanities and Commons Open Repository Exchange, which is stored in the Columbia University Libraries' long-term digital preservation storage system. Finally, *Art Style Magazine* aims to improve how research production quality is evaluated through publications, being a signatory to the main agreements that pursue practices related to research articles published in peer-reviewed journals, which can and should be extended to other products, such as datasets, because they are relevant research results. However, if your interest is in furthering your reading and publishing skills because you are a lover of the arts and literature, all these requirements seem meaningless. The meaning extends the life cycle of published works beyond traditional publishing methods. In the digital age, everything must be digitally safeguarded for the future. In general, all of humanity's achievements are turned into data, information, and memories for the better and its continuity! That is what we want. We are working to better preserve the arts! Anyway, I wish you, a reader interested in art, culture, and academic research, a good read!

Christiane Wagner
Editor-in-Chief and Creative Director

Material Image
Affordances as a New Approach to Visual Culture Studies

Renaissance paintings, fashion and clothing, people, oscilloscopes, food as art, Instagram, photo collections, Greek vases, ancient mirrors, and damaged coins – what do all these "things" have in common? Not much at first sight, except for being part of the human world, that may catch our attention and stimulate us to engage with them. This is the answer: all natural and artificial things mentioned inhere affordances that appeal to our cognitive system, i.e., material, formal, temporal, emotional, aesthetic, technical, semantic, or cultural properties that invite us to look at them, perceive them, think about them, interpret them, and use them. The concept of *affordances* roots in the studies of the American psychologist James J. Gibson, who revolutionized the field of perception studies in the 1960s. According to him, "things" naturally inhere *affordances.* They offer a certain range of possible activities depending on their form, time patterns, and material qualities, thus becoming part of human-thing-interactions. However, *affordances* are not only "natural" properties of "things," as proposed by Gibson, but the perception and employment of *affordances* can be culturally trained. This aspect has been intensively discussed subsequently within different disciplines (e.g., Social Sciences, Design Studies), and made the concept of *affordances* a powerful tool to analyze the interaction of humans with their natural environment and with the things that surround them in daily life, namely material and visual culture.

Nonetheless, *affordances* have not yet received much attention in the field of Visual Culture Studies. Only recently, for instance, archaeological scholarship started to tackle questions regarding the interaction between humans and things from the viewpoint of *affordances.* As the articles of this special issue show, this approach is now gaining momentum in a broad range of image- and object-related disciplines. It may not surprise that the authors' perspectives on images and objects vary widely within the issue. However, thanks to the use of *affordances* as a theoretical and/or methodological tool, they all contribute to fundamental questions of perceiving, receiving, understanding, as well as interpreting, and acting with sensuously present culture.

The first papers tackle basic theoretical frameworks relevant for an evaluation of the *affordance* concept. Martina Sauer's historiographical and comparative study of formal Aesthetics, Iconology, and Vitality Semiotics applied to *Dürer's Christ among the Doctors* from 1506 introduces *affordances* as a new method in Visual Culture Studies. Against the background of her former research in *Gestalt* theory, Petra Leutner notes that *affordances* are increasingly reflected in the field of fashion. In his systematic approach shaped by cognitive science, Klaus Schwarzfischer stresses that any situation of man holds *affordances*, and therefore artifacts are not necessarily prerequisites for *affordances.*

In the next section of this volume, the authors explore *affordances* of modern technologies and media as well as their impact on art. Stefanie Bräuer shows that even oscilloscopes held a variety of *affordances* for the early film industry. The role of food in modern art is the topic of Fabiana Senkpiel's paper, which discusses the extent to which food – either displayed for eating, invested with symbolic meaning, or staged as decaying objects– provides *affordances* for artists and viewers. Sarah Ullrich and Katharina Geis explore how Instagram's digital infrastructure enables the (re) contextualization of art-related photographs. Based on the analysis of Paul Graham's photographic project 'a shimmer of possibility,' Hans Dieter Huber emphasizes the importance of aesthetics for the *affordance* concept.

The last part of this special issue is devoted to ancient visual culture. Yael Young uncovers new *affordances* of Greek amphorae in an iconographic study, including their surprising use as sex toys. Eroticism is also an important element of ancient mirrors, as Nikolaus Dietrich shows in his paper, adding this aspect to a wide variety of *affordances* that touch upon gender relations. Finally, Elisabeth and Sven Günther explore Greek and Roman coins' materiality and how changing socio-political contexts led to physical alterations of the metal coin, e.g., by cutting and scratching. The aim of this special issue is to explore this fascinating potential of images and objects in order to think about visual culture from the new perspective of *affordances* and to apply new methods and to bridge the gap between sensuously present materiality and action- and knowledge-relevant meaning.

Not by chance, the articles of this volume deal with a wide range of topics, whether from prehistoric or classical, modern or contemporary times, with a wide variety of production techniques and from different research approaches. Thus, the concept of *affordances* bears a huge potential for all disciplines that engage with visual culture since *affordances* are part of every image, every object, every artifact. The concept of *affordances* applies even to this issue and to the editorial you are reading right now: styled by the editors and authors, it affords you to read, and to think about, to reflect on, to consume texts and images. You can print your version or see this special edition online on *Art Style Magazine*'s website.

Elisabeth Günther
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Affordance as a Method in Visual Cultural Studies Based on Theory and Tools of Vitality Semiotics

A historiographic and comparative study
of Formal Aesthetics, Iconology, and Affordance using the example
of Albrecht Dürer's *Christ Among the Doctors* from 1506

Martina Sauer

For Hega Kaiser-Minn,
an inspiring and open-minded
Heidelberg teacher of art history

Abstract

In a historiographical and methodological comparison of Formal Aesthetics and Iconology with the method of Affordance, the latter is to be introduced as a new method in Visual Cultural Studies. In extension of epistemologically relevant aspects related to style and history of the artefacts, communicative and furthermore action and decision relevant aspects of artefacts become important. In this respect, it is the share of artefacts in life that the new method aims to uncover. The basis for this concern is the theory and methodological tools of Visual Semiotics, which I have already presented. A direct comparison of the three methods based on the same example should clarify the points of contact and the respective performance of the methods. For this purpose, the *Christ among the Doctors* of Albrecht Dürer from 1506 will be used, which was already examined in 1905 and indirectly in 1915 by the prominent representative of Formal Aesthetics Heinrich Wölfflin, and in 1914 and finally in 1943 by the founder of Iconology Erwin Panofsky. With the new method the communicative-action and decision relevant aspects and thus their share in life should be shown.

Introduction

It is Formal Aesthetics and Iconology that have dominated art historical methodology from the beginning of the 19th century until today. More recently, however, it is mainly prehistoric and archaeological studies that have dealt with affordances in order to clarify the historical classification, use and meaning of artefacts. This came into their focus because there are hardly any comparable stylistic devices and other e.g. text-historical sources to make them accessible. Thus, the researchers concentrated —and this is really new— on the communicative aspects of the artefacts themselves. The concept of affordances is therefore a materially based approach that includes analyses of handed-down artefacts as well as pictorial and, more recently, aesthetic aspects. In summary, it is the impact of artefacts on life that the new approach in Visual Cultural Studies reveals. Against this promising background, the question arises: Can Affordance be established not only as an approach but also as a method in Visual Cultural Studies?

To this end, the two existing methodological approaches are to be compared and expanded using an analytical instrument of Affordance or Vitality Semiotics that I have already introduced. The latter is based on material and, more importantly, ecological, developmental psychological as well neuroscientific and cultural anthropological studies and theories by Jakob von Uexküll 1909, Heinz Werner 1926, Ernst Cassirer 1929, 1942, and 1944, James J. Gibson 1966, Susanne K. Langer 1965 and 1972, Daniel N. Stern 1986, Giacomo Rizzolatti et al. 2013 and others.[1] In addition to the scientific comparison, the article will use the example of the famous *Christ among the Doctors* of Albrecht Dürer from 1506 to show what the three methods can ever achieve in comparison. This example was deliberately chosen, since two fundamental representatives of Formal Aesthetics and Iconology, Heinrich Wölfflin in 1905 and indirectly in 1915 and Erwin Panofsky in 1914 and finally in 1943, submitted studies on the subject. Finally, it should be shown that, contrary to the negative assessment of Dürer's work by the two researchers, which has found new approval today[2], the analytical instrument of Affordance provides a positive view of the work that is in harmony with the countless imitators and admirers to this day. This somewhat different assessment is essentially due precisely to the fact that the new method is able to establish a connection to life.[3] As suggested, the present contribution begins with an introduction to the historiography of each method, followed by applied analyses in each case, and ends with a summary in favor of establishing Affordance as a complementary method.

Historiography and Method of Formal Aesthetics

When in 1905 Heinrich Wölfflin wrote his book on Albrecht Dürer, he methodically followed Formal Aesthetics, which was first introduced by Robert Zimmermann in 1854 and 1865, and deepened by his successor Alois Riegl in 1893 and 1901, and finally culminated in his own methodical book *Principles of art history: the problem of the development of style in later art* in 1915. The methodological focus of Formal Aesthetics lies in the analysis of the artefacts' structure. This is the relational logic of their individual abstract forms and the composition they form as a whole. It thus starts with materially realized forms.

Their structure, understood as such, is seen not only as responsible for the arousing of aesthetic experiences of lust and unlust, as Zimmermann already emphasized, but also as the respective preferences of producers and of cultures and societies. Accordingly, the historical differences in styles testify to a specific will to art, a *Kunstwollen* as Riegl said. Later, it was Wölfflin followed by Max Imdahl and Gottfried Boehm, who spoke of preferences for forms that express the different human ways of seeing or viewing the world. These preferences show themselves in linear or painterly dominated effects of design means spread on canvas or paper, carved in copper or wood and realized by modelling wood, clay or stone in sculpture and architecture, etc., by an artist, designer or architect.

They allow to speak of a history of seeing. However, Konrad Fiedler and Hans Sedlmayr proposed, they represent also an adequate or essential representation of the world. In difference to this idea, Boehm said, that these representations are historically selected and expressed views of a world, which have and are always been known to everyone[4]. In summary, it can be said that it is the respective human interest in the world that the analyses of Formal Aesthetics with their materially and empirically oriented methods seek to uncover. It is thus a history of human mentality and its respective historical preferences that are at the center of Formal Aesthetics (cf. Table 1)[5].

Researcher	Design means	Effect on the beholder	Aesthetic experience	Meaning	Function of Research
Robert Zimmermann 1854, 1862 In all kindred arts	Empirical facts (mathematical) relational logic of forms dominated by e.g. tones in music and colors in pictures	Aesthetic mood of harmony or disharmony	*Lust* and *unlust*	Value for things and actions	Aesthetics as science of forms based on the analysis of aesthetic orders
Konrad Fiedler 1876, 1887 In all kindred artefacts	Empirical facts (mathematical) relational logic of forms that follows the logic of the visible by an unconscious movement of the hand	Productive seeing, "productive Anschauung" of the content	Pure, free and independent viewing of the essential content	True, epistemic value of the content	Epistemic knowledge of the essentials of the visible world
Alois Riegl 1898, 1901 In all kindred artefacts	Empirical facts (mathematical) relational logic of forms dominated by haptic or optical effects	Distinguishing between objective and subjective effects organic and crystalline	Experiencing optical or haptic, 'tangible' near-sighted or far-sighted effects	Historical value, preferences of designing *Kunstwollen*	Distinguishing the *Kunstwollen* of an epoch; history of human mentality (preference of will)
Heinrich Wölfflin 1915 In all kindred artefacts	Empirical facts (mathematical) relational logic of forms dominated by linear or painterly principles	Distinguishing between linear and painterly; plane and depth; closed and open; multiplicity and unity	Experiencing optical or haptic, 'tangible' unclear or clear far-sighted or near-sighted effects	Historical value, preferences of perception of man in the epoch of Renaissance and Baroque	Distinguishing the history of seeing *Geschichte des Sehens* as a history of human mentality or taste (*Geschmack*)
Hans Sedlmayr 1948 In all kindred artefacts	Empirical facts (mathematical) relational logic of forms to reveal the essential content	Recognizing the true or untrue value of the essential content	Experiencing the true or lost truth of the essential content	Historical value of the true vs untrue essentials	Distinguishing the structural form to derive the true/untrue essential of its meaning
Max Imdahl 1963, 1974, 1979, 1987 In all kindred artefacts	Empirical facts (mathematical) relational logic of forms dominated by linear or painterly principles	Distinguishing between a dynamic, formally-oriented, conceptually blind seeing *sehendes Sehen* and an (normally dominant) object-oriented, intellectually, recognitive seeing *wiedererkennendes Sehen*	Experiencing abstract, formally oriented and object-oriented, recognitive effects	Historical value of preferences of the perception of man be it of a dynamic, formal-oriented or no object oriented seeing of the world	*Ikonik* distinguishes between epochal preferences, between linear thinking vs. pictural feeling; history of human mentality (preference for a concrete or dynamic world view)
Gottfried Boehm 1978, 1980, 1992, 2008 In all kindred artefacts	Empirical facts (mathematical) relational logic of forms without distinguishing between linear and painterly principles	Distinguishing between simultaneity and succession of dynamic and object-oriented processes of perception	Experiencing the iconic, that means dynamic oriented effects and object-oriented effects	Historical value by distinguishing the *Kunstwollen* or iconic dense (*ikonische Dichte*) of an epoch or work of art	*Iconic turn* examines the history of seeing, *Geschichte des Sehens Kunstwollen* or iconic dense (*ikonische Dichte*) of the selection of perception from the primordial ground, *Ur-Grund*, from what everybody knows

Table 1: Historiography of Formal Aesthetics form mid of 19th to 20th Century by Martina Sauer

Heinrich Wölfflin and Dürer

It was Heinrich Wölfflin who pioneered the research of Formal Aesthetics by presenting a first examination of different world views, which are characterized by different preferences in design means. He demonstrated this using the example of the differences between the Renaissance style in the 15th century and the Baroque style in the 16th century. In the former, linear design principles predominate, while the latter are dominated by painterly principles. They bear witness to different modes of imaginative (*der anschaulichen Vorstellung*), and are thus evidence of a history of seeing (*Geschichte des Sehens* that favors different styles of forming the world. This can be revealed by analyzing the forms, and thus the artefacts can be assigned not only to an artist but also to an epoch in art history and their respective will (*Kunstwollen*), as Riegl described it, or their "taste" (*Geschmack*), as Wölffin said.[6]

Wölfflin's assesssment of the artist Albrecht Dürer (1471-1528), the son of a goldsmith from Nürnberg in Germany, is clear with regard to this differentiation scheme. He is his most prominent example of the art of the Northern Renaissance and thus of the linear style, which found its highest quality in his woodcuts and engravings. This is significant in view of his analysis of Dürer's *Christ among the Doctors* (Fig. 1), which he thus considered to be an inferior oeuvre of the artist as early as 1905. Accordingly, he did not even mention it in his *Principles* of 1915. This assessment not only shaped Panofsky, but continues to have an effect to this day. It is reflected in the assessment by the Dürer specialist Thomas Schauerte, who in 2009 questioned the attribution as a work of Dürer[7].

Figure 1: Albrecht Dürer, *Christ Among the Doctors* (after Leonardo?), 1506,
Oil on panel, 64.3 x 80.3 cm, Museo Nacional Thyssen-Bornemisza, Madrid
(PD-US-expired, wiki commens)[8]

Especially in Dürer's woodcuts and engravings the older tradition of late Gothic German art is visible. These artists did not use the line as an isolated line like the Italians, e.g. Leonardo da Vinci, but as a late Gothic painterly knot (*spätgotisch-malerische Knäulwerk*), creating effects of *multiplicity* rather than unity. Thus, the lines in Dürer's engravings also dominate the movement of the plastic forms. Accordingly, even the folds of robes are a linear event, while color and light are subordinate. The shadows are dark and the colors are locally limited. Even planes are interpreted as *tangible, closed forms*. This typology corresponds to the fact that Dürer prepared all his engravings very carefully by preparatory drawings on paper in pen and ink drawing hard lines. A care that Dürer lacked in his *Christ among the Doctors*[9]. Taken together, Dürer's design means are keeping with the style of the 1500s. It is characterized by a will to the plane (*Wille zur Fläche*[10]). This effect corresponds to an orientation of the composition towards a stable, tectonically solid anchoring in the horizontal and vertical with full *sharpness* of every detail (*Wille zur geschlossenen Form*[11], and *zur Klarheit*[12]) without emphasizing central aspects such as Leonardo da Vinci[13]. Against this background, Dürer's pictures cannot keep up. Wölfflin therefore assumed that even Dürer's attempt during his second trip to Italy from 1505 to 1507

> "to create a great painting did not go far. We know expressions of discouragement in Dürer, where he accuses the circumstances and where he sighs about himself. It seemed to him more advisable to continue working in the field of mere drawing."[14]

Correspondingly, Wölfflin was not convinced by the small series of the paintings from this time, and especially not by the *Christ among the Doctors*. They are all just "exercises" (*Übungen*). He considered the latter as unfinished and therefore only as a "curiosum". The fact that as noted in the painting, it is only performed in five days, confirmed him[15]. What irritated Wölfflin the most, however, was the addition of heads one after the other without any relief and legality in the directions on the plane. Only their psychological expressiveness and their interpretation as a discussion among people convinced him, probably inspired by Leonardo's character heads. Moreover, it irritated Wölfflin that the twenty fingers in the center of the picture only reminded him of late Gothic knotted branches, although they had been executed more finely in the preparatory drawings (Fig. 2).[16] On the other hand, the head of Christ is much softer in the painting than in the drawing (Fig. 3). A circumstance that Wölfflin did not mention, but which, as can be shown, only becomes important later in the analysis of Affordance.
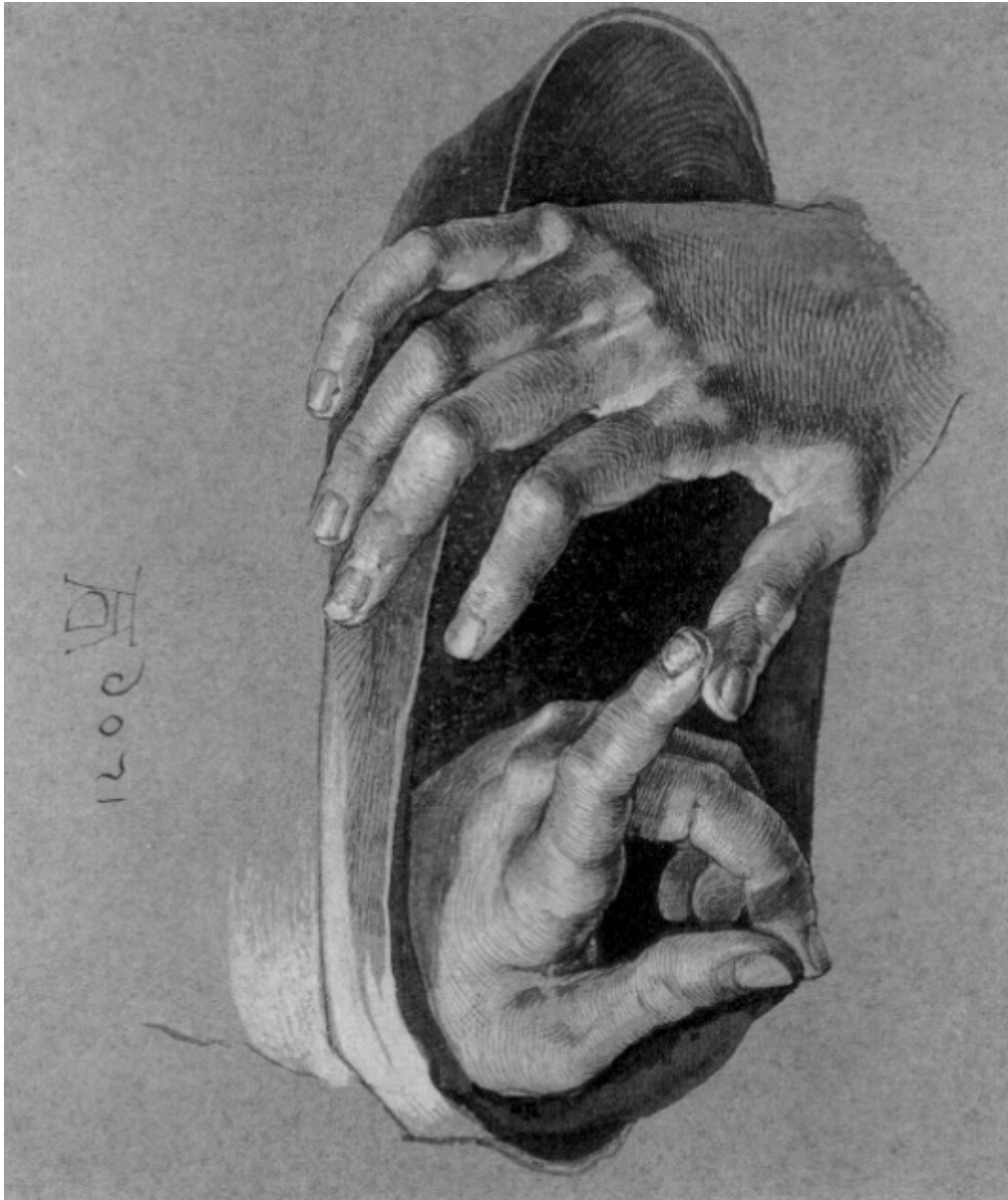
Figure 2: Albrecht Dürer, 1506, *Hands of the twelve years old Christ*, drawing on paper, pencil, 20,6 × 18,5 cm, Nürnberg, Germanisches Nationalmuseum, Graphische Sammlung (Sammlung Bernhard Hausmann), Inv. Hz 5482 (public domain: http://www.zeno.org)

Figure 3: Albrecht Dürer, 1506, *Head of Christ drawing on blue Venetian,* paper, pencil, heightened with white, 27,5 × 21,1 cm, Albertina, Wien, Inv. 3106
(public domain: http://www.zeno.org)

Historiography and method of Iconology

When Erwin Panofsky presented his research in a final book on Dürer in 1943, he completed his previous research on the artist, which had already begun in 1914 with his doctoral thesis in Freiburg im Breisgau, Germany. This last book on Dürer is of particular interest in this case because it was published after his two well-known methodological essays in which he presented the fundamentals of his so-called Iconology in 1932 and 1939. The first was revised by him in 1964, the second already in 1955. Even though he was familiar with Formal Aesthetics as the dominant art historical method at the time and respected by him in certain aspects[17], he did not consider it a suitable method for the analysis of artefacts[18].

The accent of Iconology as a method is on the analysis of the historical background of artefacts. Instead of a phenomenological, material-based analysis of the empirical relational logic of abstract forms, the focus is on the motifs themselves. Its methodology is in the tradition of 18th century Speculative Aesthetics, especially the empathy theory of Friedrich Theodor Vischer. Her approach is based on a historical analysis of what is considered beautiful and true in culture and time. Following critical objections by Robert Zimmerman in 1854 and 1862[19], Vischer revised his original text in 1866. In the following it was his son Robert who, in his doctoral thesis of 1873, combined his father's theory with Formal Aesthetics by referring to body-bound sensations of formal structures as a starting point. The Vischers' research was productive for Aby M. Warburg in his doctoral thesis of 1893 and was further developed in his famous essay on the snake ritual of the Hopi Indians in North America in 1923. He is said to have been the first to use the term Iconology to establish an atlas with images from different cultures and times. This was to support his thesis of a universal grammar of human expression, the so-called pathos forms (*Pathosformen*). It was his colleague the philosopher Ernst Cassirer, who in 1929, finally summarized these considerations in a conclusive concept that Panofsky followed. Thus, Cassirer also assumed that the essence of man is rooted "im Erleben und Erleiden", that is the experience and suffering of the world. It is the ability of human perception to grasp these experiences through the perception of expression *Ausdruckswahrnehmung*. In an ongoing process of externalization (*Entäußerung*), these expressive perceptions are distanced in symbolic forms, be they mythical, visual and linguistically and/or logically articulated. The manifestations of this process became the basis for Erwin Panofsky, who worked closely with Warburg and Cassirer at the newly founded University of Hamburg in 1919. Thus, it is these manifestations of the externalization process that Panofsky has methodically captured in his three well-known methodologically important categories of *pre-iconographic* (naming of motifs), *iconographic* (differentiation of the typology of motifs in culture and time) and *iconological* (special significance in culture and time) analysis (see Table 2).[20]

Researcher	Design means	Effect on the beholder	Aesthetic experience	Meaning	Function of Research
Friedrich Theodor Vischer 1866, 1887 In all kindred arts	The outer appearance in analogy to absolute ideas	*Anschauen* or "phantasy" connected with an "innocent borrowing of unconscious soul sentiments" as an act of looking at absolute ideas	Sensibility as an act of inner experience of absolute ideas	Appearance according to the true and beautiful, of absolute ideas	Distinction the true and beautiful, the "speculative Aesthetics" by a historical analysis theory of empathy or projection, *Einfühlungstheorie*
Robert Vischer 1873 In all kindred arts	(mathematical) relational logic of forms (of light, color, contour, line, planes) guided by ideas of humanity	External sensation as sensitive and motoric effects in combination with sensitive and motoric empathy (*Zufühlung*)	Sensitive-motoric and empathic effects of harmonies between the beholder and the object	Sensitive-motoric and empathic awareness in the arts as humanity, objectifying itself in harmonious forms	Distinction of harmony as a process of sensation and empathy (theory of sensation and empathy)
Aby M. Warburg 1893, 1923 In all kindred artefacts	Sensation of affective-vital energies of "pathetic forms" (*Pathosformen*), e.g. gests, rituals, equipment and human actions	Reaction to the interferences between affective-vital energies and cultural processing patterns as an effect of relaxing or taking fear	Compensation of phobic effects: "You live and do nothing to me" (*Du lebst und tust mir nichts*)	Means of control of pathetic effects	Establishing a pragmatic language of expression (*pragmatische Ausdruckskunde*), of universal anthropological pathic forms (*Pathosformen*) culturally diversified in different styles, collection of it in an atlas of pictures (*Bilderatlas*)
Ernst Cassirer 1929, 1942, 1944 In all kindred arts	(mathematical) relational logic of physiognomic characters, of moving and spatial forms, e.g. colors, lines, of light and shadow)	*Erleben und Erleiden* by the *Ausdruckswahrnehmung*, experiencing and suffering by the perception of expression	Of real and virtual "living forms" in nature and the arts	Appearance of the living world as symbolic forms of a mythical, read and known world, a world that is generated by the self	Distinction of the *Prägnanz*, the conciseness of symbolic forms in mythical, visual and linguistically and/or logically articulated forms
Erwin Panofsky 1932, 1939 In all kindred artefacts	Figures and their specific forms experienced and known as symbolical meaningful	Knowledge of inner experience about a culture in time symbolized in artefacts	Inner experience of the self-created, symbolic meaning of a culture in time	Manifestations or documents of symbolic forms of a culture in time (Cassirer)	Distinction between pre-iconographic, iconographic, and iconological meaning; historical analysis

Table 2: Historiography of Iconology form mid of 19th to 20th Century by Martina Sauer

Erwin Panofsky and Dürer

It is the historical analysis of Panofsky's view of Dürer that contrasts with Wölfflin's. Nevertheless, like Wölfflin, he considered the woodcuts and the engravings to be Dürer's most important works. To these belongs the woodcut series of 15 of the *Apocalypse* of 1498 which is, like Leonardo's *Last Supper*, one of the most important and "inescapable works of art."[21] Summarizing it is the period from 1495 to 1500, Panofsky evaluated "as the most distinctive "maximum" phase of Dürer's carrier". He established himself as an independent master whose works "represent a first synthesis between Flemish and German traditions and the *maniera moderna* of the Italians and lay the foundation of a Northern Renaissance."[22] This raises the question of how Panofsky assessed *Christ among the Doctors* of 1506. Just like the *Feast of Rosary* (Fig. 4) it dates from 1506 during his stay in Venice. Both belong to the *iconographic scheme* of the cult of the Rosary, which took on concrete forms with the founding of the Confraternity in Germany in Cologne by the Dominican inquisitor Jakob Sprenger in 1475. This cult is based on 15 promises which the Blessed Virgin Mary transmitted to St. Dominic. It is known to all as a special form of daily prayer in which Hail Marys and Our Fathers alternate (165 in all), and as a necklace of white and red beads or roses that allows these invocations to be counted, since each Hail Mary is represented by smaller white beads and each Our Father by a larger red bead. It expresses the idea of a Christian community united by Roman Catholic beliefs, victorious in its struggle against all forms of heresy, and which worships Christ and the Virgin Mary with equal devotion and, as Panofsky expressly pointed out, "is very Dominican," encompassing both the clerical and the lay elements.

Figure 4: Albrecht Dürer, Feast of Rosary, 1506, Oil on panel, 162 x 192 cm,
National Gallery Praque, ID 1552 (PD-US-expired, wiki commons)

However, the attribution of the *Feast of Rosary* to the iconography of the cult of the Rosary is not clear. Rather, it belongs to the iconography of the brotherhood itself. Thus, Panofsky called it accordingly in contrast to the original title *Rosary Brotherhood.* This is for Panofsky of importance because the actual "feast" of the Rosary, was not invented until 1573, when Gregory XIII wanted to commemorate Lepanto's victory over the Ottoman Empire. [23] With regard to the motifs and the composition, however, Panofsky's *iconological* interpretation does not go far enough, for precisely this picture is to be understood rather as a declaration of the German Empire to the Roman Catholic Church, which differs from those of other faiths. This is supported by the location behind the Alps and the naturalized portraits, and thus the individualized view of clergy and laity according to the monumental conception of the foreground. The latter is made clear by the positioning of the Pope in his Fanon and the German Emperor Maximilian I in a knightly amor in devotion before Mary as Queen of Heaven with the Child Jesus.

Together they crown the Christian and the secular leader as defenders of the "true" doctrine. Dominic himself, the guardian of the Christian faith, is relegated in the background by Dürer, contrary to iconographic tradition. The fact that the altarpiece was ordered by German merchants from Dürer for the Confraternity in Venice and their church of S. Bartolommeo also speaks for this interpretation, which is much clearer in political and religious terms.

In contrast, but ultimately in accordance with the commission given to Dürer for Venice, it is the *Christ among the Doctors* that belongs to the iconographic tradition of the cult of the Rosary itself. In accordance with it, it shows the fifth and last station of the Joyful Mysteries of the Virgin[24], supplemented by the five Sorrowful Mysteries. A letter in which Dürer mentioned "a *quar* (that is a *quadro*, a painting) the like of which I have never done before", proves –if it was this work– that it was not completed before September 23, 1506. The assumption that it was realized in five days, as the inscription said, can be doubted, as Panofsky made already clear, because it can be assumed that Dürer neither counted the underdrawing nor the careful preparatory studies. However, it was "in spite of its careful preparation executed in an almost impromptu fashion", in contrast to his otherwise meticulous brushwork. Here he meets with Wölfflin's negative judgement.[25] And although the influence of the Italian tradition did not surprise him, as the composition of the motif, the technique and the *iconographic* typology showed, it is precisely this rapprochement with the Italians that Panofsky criticised[26]. It is based on the assumption that Dürer worked from a "lost cartoon" by Leonardo, for which he was commissioned by Isabella d'Este in May 1504. It is mainly a version by Bernadino Luini (Fig. 5) around 1512 and several copies of this "lost cartoon," that suggest that a work by Leonardo actually exists. Since 1968, when a painting study attributed to Leonardo appeared in America (Fig. 6), the discussion has flared up again.[27] But regardless of this, Panofsky insinuated that Dürer's *Christ among the Doctors* could certainly only be regarded as a "Gothic version" of it. The twenty fingers of Christ and the wicked doctor led him to this.

> [They] "give the impression of entangled roots or tendrils rather than of articulated human hands, so that the whole composition is not built up from clearly defined and fully developed plastic units but from fragmentary shapes, floating in space, crowding one another, and yet arranging themselves into a kind of ornamental patter: a magic ring with the four hands in the center."[28]

Again, he meets with Wölfflin in this assessment.[29]

Figure 5: Bernardino Luini, *Christ among the Doctors* (attributed after Leonardo), 1515-1530, oil on panel, 74,2 x 85,7 cm, National Gallery, London (CC BY-SA 3.0, wiki commens, nl).

Figure 6: Leonardo da Vinci (attributed), *Christ among the Doctors*, c.1472-95 or c.1500-05, a painting study, oil on canvas, 59,5 x 89,5 cm, private collection, © part of the comparative study by Jeffrey A. Dering and Joseph A. Polizzi (2001-2009)

Historiography and method of Affordance based on Vitality Semiotics

Formal Aesthetics and Iconology provide, as the chosen example already showed, methodologically relevant procedures for the analysis of artefacts, which allow insights into culturally relevant findings, whether on the a-historical, human mentality or on historically determined preconditions. Their results show either formal aesthetical effects or cultural-historically relevant backgrounds of the artefacts. Stylistically and historically relevant meanings can be pointed out. Both, thus provide insights in epistemologically relevant knowledge.

However, particularly with regard to prehistoric, early historical and archaeological studies, both methods have reached their natural limits. The study of affordances originally introduced by James L. Gibson in *The Senses Considered as Perceptual System*, in 1966, proved to be an adequate approach to fill this gap by reconstructing the possible use and the situation of the find. The respective appeal of the find to a possible human usability with regard to the preconditions to the human senses thus became important. The situation, material, form and/or color of the find, thus provide the researcher with information about the technical possibilities, the possible use and cultural meaning of the find for the people of the time.[30]

However, with respect to the claim to introduce and establish Affordance not only as an approach but also as a method, Formal Aesthetics and Iconology prove to be valuable and connectable. On the one hand, it is the a-historical precondition which was pointed out by Formal Aesthetics that is of interest for Affordance as a method. It can be related to Gibson who indicated that the human senses are a perceptual system which is not to be understood as an entrance for sensations, but actively feels and discovers the world.[31] On the other hand, it is the cultural-historical background uncovered by Iconology which is of interest for developing an understanding of situations in life that are formed or even dominated by the rules of use and meaning i.e. the affordances of artefacts. In the *Theory of Frames* originally invented by Gregory Bateson 1955 and conceptually elaborated by Erwin Goffman 1974, these effects are now discussed. However, these two aspects can be connected also to the concept of *Vitality Semiotics* which I introduced in earlier research. For it is also based on an a-modal (multi-modal) concept of human perception that is responsible for human reactions and responses. Not Gibson or Bateson, who were introduced to me by the archaeologist Elisabeth Günther, but

the researchers in Hamburg and subsequently with the emigration in the USA on ecology (*Umwelt*), on questions of developmental psychology, cultural-anthropological and neuroscientific contexts, such as those by Jakob von Uexküll in 1909, Aby Warburg in 1893 and 1926, Heinz Werner in 1926 and Ernst Cassirer in 1929, 1942, 1944, and also by Susanne K. Langer 1965, 1972, Daniel N. Stern 1986, and, connected to the latter, the research group around Giacomo Rizzolatti 2013, form the original basis of my research on the theory of Vitality Semiotics (Table 3).[32]

In terms of methodology, research on Formal Aesthetics can be considered relevant. This means that it is the abstract formal design means or affordances that arouse feelings or rather so-called vitality-affects[33], actions, and decisions. In relation to artefacts, these means of design depend on the producers, i.e. on the choice of materials, techniques, and other means of design by the designer, architect or artist, with which they create, for example, the painters a composition of virtual "realistic" or abstract forms, with or without volume, in space or not. So, it is these abstract formal design means that appeal to our human perception. Simultaneously, dynamic- and thus also feeling-oriented processes and processes of succession that are object-, or form-oriented are evoked. With regard to the methodological analysis, however, it is important to first concentrate on the process of forming that the means of design trigger. This means, that it must first be analysed with which design means forms (objects), volume, and space were realized. In a second step, their aesthetic potential as "virtual living forms" and insofar their vitality affects should be analyzed. Their effects must be related to the situation and culture in time and later and confronted with possible effects on foreign situations and cultures in time and later.[34]

For example, in paintings, the analyst must focus on the use and effects of colors or non-colors and the effects how they give form or not, how they give volume or not, and how they give space or not. The way how they are distributed on the surface, as planes or lines, coherent or broken, pasty or thin, is important for this evaluation process. Thus, the results of forming and what emerges from them, whether realistic or not, and the feelings or rather vitality-affects they arouse, are important not only in terms of composition as an effect of lust or unlust, but also in terms of the forms and objects that become more or less concrete.

With regard to the relevance of action, it is not the object itself that becomes important, which can or cannot be recognized, but the feelings or rather vitality-affects it arouses in relation to our situation and culture. Thus, it is not iconological aspects with the intention of gaining insights that become important, but those

that have a relation to the situation in life, as the Theory of Frames as such investigates.[35] Actions and decisions depend on what the artefact of the producer or the client behind it "says." Aesthetic feelings or vitality-affects are thus not only a reaction to a decoration, and thus more or less dependent on the taste of the beholder, but are relevant to action, and thus to decision-making[36]. They are important in relation to our situation and culture, and can be evaluated as important for further actions and decisions that affect our situation but also of others.

In summary, it can be said that this is Vitality Semiotics, which is of central importance for *Affordance* as a method. Conversely, the concept of Affordance as a method is based on Vitality Semiotics. Its value is not only relevant for knowledge, as Formal Aesthetics and Iconology show, but also for action, and thus for life.

Preconditions in "vitality Semiotics"	Design means	Effect on the beholder	Aesthetic experience	Meaning	Function of Research
This is an a-modal (multi-modal) concept of human perception (cf. my research on Werner, Gibson, Langer and Stern, Rizzolatti et al.) that is responsible for human reactions and responses (cf. my research on Cassirer, Warburg and Langer)	Design means or affordances that appeal to human perception (cf. Sauer 2014a, 130-156, and Sauer 2018a, 155-190)	Reactions and responses to design means or affordances (cf. my research on Cassirer, Warburg and Langer)	Triggering of evaluation processes or *Wertebildungs-prozessen* by design means or affordances (results in Sauer 2014a,130-156, and 2018a, 155-190)	Affordances or design means which arouse vitality-affects, which are responsible to feelings, actions, and decisions which are important to one's own or foreign cultural background in time or later (results in Sauer 2014a, 157-209, 2018a, 191-269)	Analysis of affordances or design means and their cultural relevant effects to feelings, actions, and decision of the own or foreign cultures in time or later (Sauer 2014a, 2018a and 2020b, forthc.)
analysis of anthropological constants of human perception that are addressed by abstract formal design means (understood as affordances) to arouse affective-vital visual, tangible, audible, smelling and/or physical balance effects which trigger feelings, actions, and decisions respectively to one's cultural background	(mathematical) relational logic of structures that address the different senses or human possibilities of perception which are evaluated with regard to colors (Sauer) forms, rhythms, intensities (Stern), and thus to vitality- affects (Stern 1986, cf. Langer 1972)	Design means or affordances that stimulate simultaneously dynamic-, and thus also feeling-oriented processes and processes of succession that are object-, or form-oriented	"Aesthetic Feelings" of virtual or real "living forms" which are critically evaluated in respect to lust and unlust, and to good or bad, and thus become important for one's own well-being, actions, and decisions	Feelings, decisions, and actions in time or later which (can) have influence to one's own situation and culture and/or to the foreign situation and culture in time, and/or even later	Methodical procedure: 1. analysis of what is given and how the composition was realized respectively to our senses: e.g. with colors or non-colors to create virtual or real *forms*, with or without *volume*, in *space* or not 2. analysis of the cultural relevant effects to feelings, actions, and decisions with regard to the own or foreign cultures in time and later

Table 3: Method of Affordance based on Vitality Semiotics by Martina Sauer

Affordance as a method and Dürer

Finally, it is now time to present once again Dürer's *Christ among the Doctors* using the new procedure of Affordance as a methodological tool of analysis. In doing so, the design means, and thus their visual vitality-affects on the realization as "virtual living forms" as well as their effects on the process of evaluating are to be shown as relevant for action. As Wölfflin has already turned out, the painting is based less on a linear system than on colored "planes" which are primary and equivalent in intensity and brightness to those used by Italian artists of the Renaissance. Thus, against a black uniform background, it is the unison of colors in orange, green, red or blue plane forms with more or less differentiated substructures that dominate the design of clothes, and thus of the figures. Only the form/dress in the middle is more expanded and more differentiated and is equipped with two colors, blue and red, and thus creating complementarity effects in orange and green to the foreground figures on the left and right, which are larger in size and extension. In sum, however, the designed forms evoke less volume but help to distinguish one form from the other. In conclusion, this is a system of forms arranged one behind the other, with reduced depth. There is more on the surface than in a room. Even a more detailed differentiation of lights and shadows are missing here to realise "real" space or at least convincing volume effects. Moreover, these effects also correspond to the heads, which are bound to the plane surface by a geometrical, tectonic system with different orientations on the surface: four parallel heads, given in frontal and half-profile, in an ascending line from left to right with the Christ's head, and three diagonal ones, given in three-quarter view, with two are in the left background and one in the right foreground. In this way, a dominant flat arrangement is realized as a closed circle line around the figure of Christ. Flatness combined with a geometric tectonic order, simple colors and forms evoke not only monumentality but proximity, both aspects of a linear system, as Wölfflin emphasized, but less of a Northern Renaissance but rather a Southern Renaissance, Italian typology. This is a result that was also confirmed by Panofsky. Moreover, as with Leonardo, these effects are emphasized by caricature-like heads, which again open a system of contrasts to the central figure. This can be seen in a differentiation of the heads, in very old and a childlike-young one, in grim and suspicious expressions and an angelic one, and thus —without knowing anything about the story behind it—in six more or less angry and one peaceful one. Against this flat, monumental and cartoon-like background, the gestures of the fingers gain in importance. Like the figures themselves, they are arranged as a double circle. Three in an outer zone and a double pair of fingers in the middle thus form a second ornamental, and thus flat pattern.

However, it is precisely this flatness and close-up vision and also the monumental, pattern-like arrangement in contrast to the cartoon-like effects, that leads the beholder. It is the special arrangement of the design means, through which the gaze is focused without any real distance to the situation, to the childlike angelically larger figure, differentiated in color, volume and space, and the entangled fingers in the center of the picture. In this way, the beholder is bounded to a figure that is directly threatened and at the same time seems completely untouched by it. Rather, she appears transcended into another world and yet concentrated on the confrontation, into which she carefully introduces her aspects. Experienced as "virtual living forms" or figures, the beholder thus "feels" affected by the situation as if it were happening to him. At the same time, she or he is aware of the phenomenon that it is just a painting. It is the affordances of the design means, which lead the beholder. Their felt effects form a sense that can be grasped by her or him. It is the beholder´s dynamic-, and object-oriented ability of perception that follows the composition of the design means and opens up the meaning to her or him. In addition, a much deeper meaning opens up when the scene depicted is related to the story in the Bible. This is about the stand of the god-like Child against every old-fashioned and near-sighted views.

Thus, an insight, or beyond that, a possible path, as a reaction to the world, with the hope of help on that path, can evoke feelings of happiness and unity in a higher idea. In contemplating the painting, this can give a feeling of power and calmness to the beholder with regard to all that what happens and has to be done normally in everyday situations. It is therefore a new testamentary Christian view that can be formed and thus have an effect on the beholder that is probably different from that of other religions with different traditions and knowledge. The original connection to the cult of the Rosary, as worked out by Panofsky, does therefore not lose its meaning. Through Dominic, the *Feast of Rosary* emphasizes above all the connection between clergy and laity. However, already the effect of this image can be estimated higher than that originally seen by Panofsky, since it speaks of a concrete alliance of power against the heresy of the German Empire and the Roman Catholic Pope. Certainly, this meaning cannot be directly transferred to the *Christ among the Doctors*, since it belongs much more to the iconographic scheme of the cult of Rosary itself than to the feast of *Rosary*. In summary, it has a much more general meaning concerning man and her or his feeling and being in the world.

Conclusion

In comparison to the results of Wölfflin and Panofsky, the analysis presented here, which was specifically oriented on the materiality of the image, opens up other, more far-reaching aspects. It is neither a mere stylistic investigation as Formal Aesthetics, nor a pure historical reflection as Iconology, and thus of two positions in which Dürer's *Christ among the Doctors* apparently failed according to the researchers. In contrast, the presented procedure of Affordance as a method showed that there is a direct connection to the beholder. It is the affective-vital felt effects of the means of design that "forms" a further meaning, which affects the beholder and her or his feelings, and affects her or his possibilities of action and decision, and which probably differs from people of other faiths because of the Christian background. It is this far-reaching result that should be presented with the tools of Affordance as a method. The method conveys a meaning –as it was the initially declared goal– that concerns one´s own life, and thus reveals a meaning that is based on the effect or communication of the picture with the viewer. The method thus shows far-reaching consequences, allowing a new, different way of reading artefacts of all materials and techniques that emphasizes the relevance of them for life. It is precisely this expanded meaning that has probably made *Christ among the Doctor* such a popular and often reproduced image from the past to the present. Its possible similarity to Leonardo´s version, which incidentally opens up a completely different meaning in terms of its affordances –a theme from another paper– does not cloud the result. On the contrary, accepting it as a "copy" with an ultimately different meaning can be seen as a strong reason to actually consider it an original from Dürer's hand.

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Notes

[1] Cf. explicitly, Sauer 2020, 2021 (forthc.) and my previous research since the doctoral thesis in Bale, Switzerland, with Gottfried Boehm, Sauer 1999/2000 and among others, ibid. 2011, 2018a [2012], 2018b, 2016a, 2016b and cf. in this context, the preceding research and planned contributions to *the Glossary für Bildphilosophie* under the heading Formal Aesthetics (forthc. 2021) and to *Speculative Ästhetik versus Ästhetik als Formwissenschaft* (1830-1870) for the *Grundriss der Geschichte der Philosophie*, vol. 1/1-3, *Die Philosophie des 19. Jahrhunderts: Deutschland*, edited by Gerald Hartung, Schwabe: Basel (forthc. 2021).

[2] Cf. Schauerte 2009.

[3] For a theoretical discussion of the relevance of art for life, cf. Sauer 2018b.

[4] First criticism of Formal Aesthetics on a-historical premises came already from Vischer 1866, 85-86, Wind 1931, 163-178, cf. 164-165 and Panofsky 1984 [1955/1932], 187, cf. in addition the criticism from Visual Cultural Studies on the interpretations oriented on the essentials in Formal Aesthetics, Frank 2008, 477-487; Schade, Wenk 2011, 35-53; Elkins et al. 2015, 81-108. Cf. summary to both aspects Sauer 2018b, 241-248.

[5] Cf. to the historiography of Formal Aesthetics from 19th century until today my previous research in Sauer 1999/2000, ibid. 2018 [2012], ibid. 2016a, ibid. 2020, cf. as well to the historiography from Zimmermann to Wölfflin, Wiesing 2008 [1987].

[6] Wölfflin 1923 [1915], preface to the 6th edition, IX-XI, quotes cf. IX. Cf. English edition: https://archive.org/details/princarth00wlff (26.11.2020).

[7] Cf. Schauerte 2009, 232-233 and 243.

[8] Cf. on provinciality, state of preservation and preparatory drawings Thausing 1884, 357-358, and Schauerte 2009.

[9] Cf. Wölfflin 1915, 36-55, cf. 36-42. This incoherence of the preparatory drawings to the painting, as opposed to their coherent use in engravings, also irritated him. Especially because Dürer saw them as premises for an artist, as he explained in his Theory of Proportion of 1528. This is also seen as a reason why *Christ among the Doctors* probably originate from Dürer, cf. Schauerte 2009, 244, and cf. also Dürer 1969 [1528].

[10] Ibid., 106.

[11] Ibid., 145.

[12] Ibid., 219-220.

[13] Ibid., 106-245, cf. to Leonardo 106.

[14] Cf. Wölfflin 1905, Lebensgeschichte: In woodcuts and above all in engravings, Dürer created "seine feinsten Dinge" (his finest things), while painting was left behind. Only after his second trip to Italy (until 1507), according to Wölfflin, did it begin to become important for him. But, so the author summarized: (original in German, translation MS) "der Anlauf, eine große Malerei zu schaffen, führte nicht weit. Wir kennen Äußerungen der Entmutigung bei Dürer, wo er die Umstände anklagt und wo er über sich selbst seufzt. Es schien ihm geratener, auf dem Gebiet der bloßen Zeichnung weiterzuarbeiten.".

[15] Cf. ibid., Italien und die großen Gemälde, 2.

[16] Cf. ibid. Cf. with regard to the drawings also note vii.

[17] Whereby for Panofsky the question of the preference of will in arts, the "Kunstwollen" (Riegl) and especially the haptic and optical as a priori conditions were of great importance (cf. Panofsky 1920 and 1925) and subsequently echoed especially in the third iconological analysis as Lorenz and Jaś in 2008 showed.

[18] Thus, Panofsky said, that a formal analysis "cannot occupy us here any further", cf. ibid., 1984 [1964/1932], 187 (translation MS).

[19] After the approach of Speculative Aesthetics, it is later also the approach of Iconology which were critically reviewed by formal aesthetical researchers. This is because the research interest on which both of them are based on, be it the experience of the beautiful (speculative Aesthetics) or the experience of the world (Iconology), which were originally seen as the motor for the formative processes, are losing ground by interpreting them both only as political, social and religious

motivated conventions. The prompt criticism, first by Zimmermann and much later by Max Imdahl and Gottfried Boehm, is primarily ignited by this. For it is precisely the Formal Aesthetics that, in contrast, holds on to the moment of experience, cf. Zimmermann 1854, 39, column 2/3, and ibid., 1862, 309, 355, cf. as well Imdahl 1979, 14-15 and Boehm 1985 [1978], 452-453. Cf. in summary Sauer 2018b.

[20] Cf. explicitly, Sauer 2018a, 2018b, and my previous research since my second book 2018 [2012], 2016a, 2016b, and cf. in this context, the preceding research and planned contributions to Speculative Ästhetik versus Ästhetik als Formwissenschaft (1830-1870) for the Grundriss der Geschichte der Philosophie, vol. 1/1-3, Die Philosophie des 19. Jahrhunderts: Deutschland, edited by Gerald Hartung, Schwabe: Basel (forthc. 2021).

[21] Cf. Panofsky 1955 [1943], 50-59, 59.

[22] Ibid., 39.

[23] Cf. ibid., 107-113, cf. 110.

[24] Cf. Gospel according to Luke in prehistory, in Bibel 1980, Lk 2,41-52 and the extra-biblical passage on the childhood stories of Thomas in the Apocrypha in Hennecke 1959, 290-291 and 298, 19, 1-5.

[25] Cf. note xiii.

[26] In particular, Panofsky mentioned, in agreement with Wölfflin (cf. ibid. 1905, Italien und die großen Gemälde, 2), the representations of teaching or debating scholars and the emphasis on the gesture of arguing by counting fingers and the extreme contrast between extreme beauty and extreme ugliness, which are part of this tradition. The former had predecessors in Mantegna, the latter in Leonardo and his "Trattao della Pittura" and his so-called "caricatures". Dürer's later theoretical explanations already suggest that he was familiar with these traditions as well as a special trip to Bologna during his stay. Cf. Panofsky 1955 [1943], 114-115, 118, cf. as well 213.

[27] Cf. in summary the comments of art historians and scientists in Tampa Bay Times, Archive, Oct. 10, 2005, "Collector claims $3,500 painting is da Vinci original":
https://www.tampabay.com/archive/1992/01/26/collector-claims-3500-painting-is-da-vinci-original/. Cf. also the comparative design analysis by Jeffrey A. Dering and Joseph A. Polizzi 2005, which has been revised in 2009: https://www.deringconsultants.com/portfolio/leonardos-christ-among-doctors/ (26.11.2020): "Historical research indicates Christ Among The Doctors, a Painting Study (c.1472-95 or c.1500-05) by Leonardo da Vinci, not only pre-dates the copy variations of Christ Among The Doctors by Giovanni Battista Cima da Conegliano (c.1504-05), Albrecht Durer (1506), and Bernardino Luini (c.1515-30), but, scientific forensic analysis by Dr. Walter C. McCrone, Ph.D., McCrone Research Institute indicates the dating time frames and evidence of Walnut Oil Binder support the conclusion that Christ Among The Doctors, a Painting Study was painted by Leonardo, and, by virtue of scientifically established chronology, predates the subsequent copy variations by Cima, Durer and Luini." In June of 1996 the painting study attributed to Leonardo hung for one day side-by-side. In this context, we would like to express our sincere gratitude to Jeffery A. Dering for sending us additional material and for granting us the rights to reproduce in part and in whole the comparative study of Leonardo da Vinci's painting study "Christ among the Doctors."

[28] Cf. Panofsky 1955 [1943], 116.

[29] Cf. note xv.

[30] Gibson 1973 [1966], cf. to the research in archaeological studies, Fox et al. 2015.

[31] Cf. Gibson 1973 [1966], 18-19, cf. also for similar research results: Uexküll 1909, Werner 1959 [1926], Stern 1986 [1992], Rizzolatti et al. 2013, and the process-philosophical and the cultural-anthropological research of Whitehead 2000 [1927], Cassirer 1964 [1929) and Langer 1986 [1965] and Langer 1972, cf. for this Sauer 2011 and ibid., 2014.

[32] Cf. note i.

[33] Stern 1986, Rizzolatti et al. 2013, cf. Langer 1972, Sauer 2011 and ibid. 2014.

[34] Cf. methodology and results regarding the genesis of abstraction in Sauer 2014a, 9-14, 110-209, and with respect to the *Deutschlandbilder* of Anselm Kiefer in Sauer 2018a, 19-30, 107-190.

[35] Cf. the project with Elisabeth Günther, Sauer 2021, forthc.

[36] Cf. explicit methodical extension in this sense in Sauer 2018a, 155-190.

Affordances in the Field of Fashion and Clothing

Petra Leutner

Abstract

The paper examines whether James J. Gibson's concept of "affordance" can be made fruitful in the field of fashion theory. Thereby first Gibson's ecological theory of perception is explained. The embedding of perceptual activities in the ecological niche of living beings forms a prerequisite for the concept of affordance. In the next step, the text addresses the foundations of Gestalt theory, since the concept of Gestalt represents a kind of precursor to the notion of affordances and leads to Gibson's theorem of 'direct perception.' On this basis, the explanation of the concept of affordance follows. Then, case studies from fashion design are examined to explore whether the social phenomenon of fashion can be seen as a performance of the clear handling of objects with the help of affordances, similar to what has been demonstrated in design theory using the example of the practical use of design objects. The argumentation tries to prove that fashion takes a different path. Particularly striking for this are selected works by the fashion designer Hussein Chalayan, who ascribes new functions to the clothes in his collection "Afterwords" (2000) and has the call for surprising handling of such clothing objects demonstrated via the medium of a performance. The designer Iris van Herpen, on the other hand, produces fashionable clothing sculptures with the 3D printer, for whose use knowledge of affordances is presupposed, but which at the same time question the usual process of dressing through the optical transformation of the living body into a hybrid object. So the interaction between object and body in general comes into focus, and the question of the handling of objects is posed anew. The text shows that in fashion, affordances are reflected and counteracted, and that the productivity of the concept in this field must be seen above all in the critical redefinition of the application-oriented relationship to objects.

Introduction

The American perception theorist James J. Gibson was received by perceptual psychology primarily for his research on the relationship between perception and active motor activity and on the importance of environmental conditions for visual perception (Goldstein 2002, 328; Guski 1994, 45). He formulated his theory of perception within the framework of perceptual systems and their fundamental link to the environment in the works "The Senses Considered as Perceptual Systems," 1966 (Ger1973), and "The Ecological Approach to Visual Perception," 1979 (Ger 1982). In the latter book he elaborates the foundations of his ecological optics. The theory of affordances contained therein found little resonance in perception theory, but some elements of the "ecological approach" have been rediscovered in recent years in various cultural and social science disciplines, including by "Actor Network Theory" (Yaneva 2012) as well as by design theory. At the center of this interest is the concept of affordance.

The emergence of this concept and its possible further development are the subject of this essay. The aim is also to reformulate Gibson's considerations from a perspective of aesthetics and fashion theory. The question is raised whether they could be made fruitful for the analysis of wearing clothing and fashion. After a brief overview of ecological perception theory, Gibson's theory of affordance is elaborated on the foil of Gestalt theory, to which Gibson referred partly approvingly, partly disapprovingly. The exposition of important aspects of the concept of Gestalt serves to make the framework for Gibson's ecological approach comprehensible. Then it will be showed, how the concept of affordance derives from ecological perception theory and Gestalt theory. After that, the possible meaning for the analysis of artistic and creative processes, especially in the interplay between body and dress, is discussed. Finally, the question arises whether the concept of affordance makes sense with regard to artistic work, or whether there is not a fundamental contradiction here, because the affordance character directs and threatens to restrict the field of perception towards certain 'practical' goals, since perception in the affordance concept is inseparably linked with environmentally based action (Guski 1994, 42).

Incidentally, it is fair to state that as neurobiological research on perception has developed over the past 30 years, new priorities have been set and theories such as Gibson's ecological approach have receded into the background. It will have to be seen in the future whether Gibson's theory can hold up in the face of neurobiological evidence. In the case of Gestalt theory, the interesting turn of events was that it received new impetus from neurobiology after threatening to lose its significance. It is integrated now into the neurobiological approaches, as will be shown below. It would be interesting to see whether this will also be possible for a concept of affordances.

Overview of Gibson's Ecological Approach

James J. Gibson's research is far less well known in German-speaking perception theory than Gestalt theory, whose roots lie in the German-speaking world, when Christian von Ehrenfels 1890 formulated his theory of qualities of Gestalt, which is also reflected in the untranslatability of the term "Gestalt." Gibson sought a way between theories of rationalistic representation and Gestalt perception. He accused both directions of various misconceptions (Gibson 1973, 19; Gibson 1982, 145, 256-257). He posited that there is direct perception, that is, that complex information is taken directly from the environment even before individual qualities of objects are realized. At this point logically arose the rejection of ideas that perception is constituted on the basis of disordered sensations that have to be conceptualized. In this there is a deep affinity to the notion of "Gestalt" in Gestalt theory. Gibson, however, demands even more clearly than Gestalt theory that research should get out of the laboratory, and in this sense it should derive the concept of direct perception more consistently from the environment.

One of the arguments for the necessity of researching perception in the context of ecological arrangements is that theories of vision, according to Gibson, could not yield new results without including movement (Gibson 1982, 196; Goldstein 2002, 328). As Goldstein points out, Gibson himself drew on experience in his practice as a pilot in World War II, and argues that humans, as moving organisms, must be studied as creatures that have oriented their perception to their own movement and, at the same time, to the movement of alien organisms that stand out from the environment on the basis of certain invariants (Goldstein 2002, 332). It should be noted that also in neurobiology today the relevance of motion perception is emphasized, and the German brain researcher Gerhard Roth points out how important it is to experience the characteristic kind of motion of living beings or objects in order to be able to infer their nature (Roth 1997, 258-259).

In his book "The Senses Considered as Perceptual systems" Gibson assumes that we find a large and rich variety of stimuli in our environment. In the act of perception, however, by no means is an arbitrary variety or unmanageable quantity of it taken in, but a rigorous selection is made. The selection corresponds to the ecological niche in which we live. Every living being has a perception system that is adapted to its environment in order to be able to survive in it. Gibson shows that the information intake is implemented by the tailoring of the organs to the specific environment (Gibson 1973, 75). In addition, the energy expenditure is as limited as possible in order to follow the economy of the organism (Gibson 1982, 146). Consequently, we see other conditions than for example the bee, which has a fundamentally different optical system.

Gibson states that our sense organs can pick up mechanical, chemical and physical stimuli. Human orientation is adapted to the medium of air and the discrimination of liquid substances or solid material. The gravitational force of the earth gives man the possibility to move upright and to orientate himself accordingly by perception on the basis of those media. The so-called ground perspective corresponds to the optical arrangement of the encountering reality from the view of the human being moving on two legs, who estimates patterns, material, arrangements of edges etc. (Gibson 1982, 142).

Gibson also develops the notion of perceptual systems because, in his view, no organ works alone; information from the environment can be unconsciously networked (Gibson 1973, 75; Gibson 1982, 263). He assumes that we actively seek perceptions: Perceptual systems consist of constantly working organs that unceasingly discover and transmit information in the dynamic world of experience. The concept of affordance assumes, as it were, a regulating function between the perceiving organism and the surrounding world. It describes a sphere that is located between subject and object.

The Gestalt Theory

The concept of direct perception in the sense of Gibson's ecological optics and the extension to the concept of affordance can only be understood against the background of Gestalt theory. The concept of Gestalt also initially assumes to approach a sphere between object and subject.

The concept of "Gestalt" was first formulated in theory of perception in terms of so-called "Gestalt qualities" by Christian von Ehrenfels (Ehrenfels 1960, 21). Von Ehrenfels refers on the one hand to considerations of Ernst Mach, and on the other hand to a concept of Gestalt in art that had already been discussed and developed in aesthetics and literary studies since Johann Wolfgang Goethe's studies on morphology. In the latter field, from Goethe to Stefan George, Gestalt was constructed as wholeness and unity of parts tending towards wholeness, and especially in the more modern expressions also: as unity of content and form (Simonis 2001, 84). Ehrenfels himself, who is considered the founder of Gestalt theory, had close contact with literature and art. His entire work is interdisciplinary in the sense of a tightrope walk between art, perception theory and philosophy, and he was familiar with the debates about Goethe's concept of Gestalt (Kobbert 2008, 235).

In aesthetic or genius-aesthetic discourse, there have been repeated attempts to place artists in the vicinity of the special ability to perceive shapes. The sociologist Georg Simmel said in reference to Goethe: he would perceive in figures (Simonis 2001, 89). This means that Goethe already sees the whole in the small, in the part. Basically, according to Simmel, Goethe was already creative like an artist in the act of perception and only needed to write down his perception. The emphatically coined concept of Gestalt understands Gestalt as a living structure that exhibits wholeness and, approximately, also "perfection" in the sense that the interaction of the parts results in a living whole, whereas the parts alone or their "sum" would not accomplish this. In Goethe's concept of Gestalt, for example, the idea of participation and transcendence plays a major role. The individual element has a part in the infinite, in that it holds the actually intangible infinite virtually or tendentially within itself.

The literary theorist Annette Simonis claims that, finally, the philosopher Walter Benjamin uncovers the metaphysical implications of the concept of Gestalt, when he formulates the demand for a disfiguration of literature and art (Simonis 2001, 324). She says, whole and parts would fall apart for him, and they no longer represent a gestalt-like organism that would move harmoniously as a whole.
Ehrenfels' gestalt qualities already show aspects which are later called typical characteristics of Gestalt: Supersummativity and transposability. A Gestalt should be more than the sum of its parts. Furthermore, the Gestalt theory according to Ehrenfels emphasizes an additional insight: the perception of the Gestalt is the primary thing.

The next generation of Gestalt theorists – Max Wertheimer, Kurt Koffka and Wolfgang Köhler – work experimentally and refine the concept of Gestalt (Guski 1996, 27). The Gestalt is a holistic entity and the change of only one piece must entail the change of the whole Gestalt. In addition to these differentiations of the Gestalt concept, a quality that can be experimentally demonstrated now comes to the fore: Gestalts are not only supersummative and transposable - in our perception they also work as "simplifiers," as principles of organization. To do justice to this aspect, the Gestalt principles are formulated (Guski 1996, 27- 28). 1921 and 1923 Wertheimer formulated various "Gestalt factors," later known as Gestalt principles: the gestalt factor of proximity, the gestalt factor of equality, the shape factor of unity, the shape factor of good curve passage (good continuation) and shape factor of the multiplication/ the common fate, and in addition, there is the distinction between figure and ground (Goldstein 2002, 192). Numerous Gestalt laws are further differentiated and new ones are added.

The Gestalt theorists understand perception as a creative process: it is not a recording like a camera, but proceeds creatively, inventively and simplifying at the same time. Modern Neurobiology has taken up Gestalt principles and reflected them. If for Gestalt theory Gestalten formed an intermediate realm between subject and object that is difficult to define, neurobiology interprets Gestalt laws as a kind of human grammar of seeing, which is pre-formed in the brain like the ability to speak. Experiments with optical illusions are taken up to show that the brain obeys the Gestalt principles, and Gerhard Roth writes about the Gestalt psychology of Wertheimer, Köhler and Metzger, their principles would have again gained special topicality especially within neurobiological cognition research (Roth 1997, 258). Roth emphasizes that the laws of seeing were extraordinarily effective and difficult or impossible to set aside will-wise (Roth 1997, 259).

The Concept of Affordance

One can better understand the concept of affordance against the background of the ecological approach on the one hand and Gestalt theory on the other. The fact that in the process of perception for the Gestalt theorists the gestalt is seen before individual pixels are perceived, and thus the gestalt form is directly received, means that wholes play a crucial role in the process of perception. This idea provides the mental bridge to be able to develop the theory of affordances. At the same time Gibson accuses the Gestalt theorists of not going far enough with their approaches.

His concept of affordance means that the environment makes certain offers to the living being (Gibson 1982, 144). What we perceive are not nonspecific constellations of light, for example, but wholes very precisely attuned to us, which turn out to be affordances. Affordance implies that the environment and organism are moving towards each other. In certain ways, environment and organism exchange on the basis of an affordance relationship. Affordances are neither subjective nor objective, but subvert this separation. They can be divided into classes: first there is the medium (air), the substances (certain surfaces like earth), there are surface arrangements (surfaces and their layout), objects and other beings (Gibson 1982, 142).

In the group of objects, Gibson distinguishes certain types of them that make characteristic offerings. He says a rigid object with a sharp dihedral angle, an edge, would afford cutting and scraping; it could be a knife (Gibson 1982, 144), or an elongated elastic object, such as a fiber, thread, thong, or rope, would afford the activities of knotting, binding, lashing, knitting, and weaving (Gibson 1982, 144). Another example are hiding places that afford dwelling or give the possibility of optical concealment.

Living beings, in turn, make reciprocal offers to each other that are extremely complex. Not the qualities of objects are seen, but the offers they make. An apple makes to us an offer to bite into; for animals it is something else. Gibson claims an affordance would be composed of invariants with varying aspects. Here again the question of economy of perception plays a role: we do not see everything, but only the necessary circumstances that correspond to our ecological niche (Gibson 1982, 146). Gibson emphasizes that perceiving an offering does not mean classifying it. Information need not be divided into philosophical classes (Gibson 1982, 145). Neither naming matters, nor what else can be done with an object. Offerings can be combined, they can overlap, and they can also provide complex information as a whole set, as well as negative perceptions, for example, danger. Of course, there is also misinformation in the process of perception. Affordances are closely related to the goal of an action. Perhaps one could say there is no action without prior affordances, but not every affordance leads to an action, because, according to Gibson, it is not a matter of a stimulus-response model (Guski 2002, 45).

Clothing, Gestalt and Affordance

The notion of affordance is amenable to design theory in several ways. Norman stated that affordance circumscribes the communication between user and object (Norman 1999, 42). This field can only be understood with the help of the assumption of affordances. One must add that the designer's work has to analyze the culturally produced and defined relationship between artifact and user, and design and construct the offerings that the object will make to the user in the course of use. Actor-Network Theory, on the other hand, goes a bit further and claims: objects are enacting the social (Yaneva (2012, 71). Man-made objects are embedded with a "script" that evokes a certain way of acting. For example, a stair railing, according to Yaneva, invites one to use it as a supportive object, as it lends security to movement as one ascends or descends the stairs.

In addition, it can be used flexibly: I can lean on a stair railing to stop and talk, or I can slide down the railing if it is slippery enough, etc. (Yaneva 2012, 73). The object's implicit invitation becomes part of my social reality and evokes activity. In this sense, Yaneva claims that the agency of things is related to the notion of affordance, and she names Gibson as a guarantor of this approach (Yaneva 2012, 72). An interesting example illustrating affordances in the field of art and architecture is provided by the Israeli artist Absalon (1964-1993). He designed models ("Celulles," 1980) and prototypes for living cells ("Propositions d'habitation," 1990-1993). His idea was to reduce the necessities of life to a minimum in exchange for housing. He constructed six white cells of different shapes and sizes, all so that one can stand and lie down in them, tailored to the proportions of the user's body, along with white fixtures such as couches, cabinets and toilets. Walls and fixtures were covered with plaster painted white, giving the impression of an ascetic life based on nothing more than the staging of affordances that indicate what is necessary for survival.

The question now is whether fashion theory can better describe or understand its object clothing and fashion with the application of the theorem of affordance. Basically, clothing and fashion must first be distinguished from each other, because clothing is the generally applicable tool of a possible covering adapted to the body, which serves the motives for clothing described by psychologist J.C. Flügel as "adornment, shame, protection" (Flügel 1986, 210) while fashion means a trend-related section of it, which is provided with the symbolic attribution of being "in fashion" (Kawamura 2006, 73; Leutner 2011, 1). In what follows, we will mostly refer to both domains.

As we have seen, Gibson himself noted, certain materials would imply the affordance of covering oneself with them because they are soft and elastic. If we consider the body-related cut of clothing, it goes further than a simple piece of fabric and makes the designer-initiated offer of being suitable for covering a particular part of the body. The pants signal the possibility of being pulled over the legs, the sweater offers to tuck the arms into the two sleeves. Dressing, in this respect, constitutes that part of everyday life that brings the body into immediate connection with artifacts and is shaped by perceptual experiences and automatisms. We perceive very easily, according to the affordances invested in them, which pieces of fabric are intended as clothes and for which parts of the body they are suitable. Fashion designers repeatedly try to thwart this simple request by expanding or inverting the formal possibilities of garments, especially when they are supposed to be fashionably striking. I will give a few examples.

In his collection "Afterwords" (2000), fashion designer Hussein Chalayan presents, among other things, a skirt made of the hard material copper or wood that can be used as a table before or after wearing (fig. 1). It is by no means made of inviting, soft material and implies from the outset several, overlapping or even contradictory instructions for action. These were explored performatively at a presentation of the collection (Chalayan 2012). In the course of which one learns that affordances can be fundamentally deceptive. At the same time, the collection aims to make a political statement by dedicating these objects to people on the run, who have to establish new kinds of relationships to things in their life situation (Loschek 2007, 82).

Figure 1: Hussein Chalayan, *Afterwords*, autumn/winter 2000.
Photo: *Coffee Table Skirt Hussein Chalayan* by Manuelarosi,
February 6, 2017. Licensed under CC BY-SA 3.0.

In his collection "Molux" (2005), designer Bernhard Willhelm created a garment that provides not just two, but a confusing multitude of sleeve-like outgrowths (Loschek 2007, 56; fig. 2). It is difficult to gauge which action offer underlies the garment, because one can also easily put one of the sleeves over one's head, resulting in an elephant-like shape. When the garment is perceived, the experience of an affordance is suspended. Instead, a different experience of the world than that of the practically manageable is brought into play: the clothing refers to its own mode of operation, questions it in the sense of a fashion statement, and directs the gaze to that relationship between body and dress that remains hidden in everyday practices. The relationship between user and object is made thematic.

Figure 2: Bernhard Willhelm, *Molux*, collection femme autumn/winter 2005/06.
Photo by Geoffrey Cottenceau and Romain Rousset, June 2006 Cologne.
Photography © Gneborg

Dutch designer Iris van Herpen creates garments that seem like spatial sculptures. They impede the supple movement of the body and instead exhibit it as an imaginative, utopian-looking figure like the famous "Snake Dress", that oscillates between human, animal and machine. The female body is transcended and at the same time locked into rigid, if graceful, silhouettes (van Herpen, 2020). Van Herpen makes large sections of the dresses using the 3 D printer, a process that until now has had little opportunity to use elastic material. The novel silhouettes owe much to the designer's experimentation with new production processes and materials on the one hand, and her artistic approach on the other. It is astonishing that the sculptural objects can be used as clothes at all. The affordances of material and form do not suggest their use as garments. The viewer's idea of the relationship of clothing and fashion to the body is completely redefined.

The punk fashion of the 1980s, which emerged predominantly from the youth movement itself, destroyed blue jeans with rips and holes and used materials foreign to fashion in new designs, such as latex, which came from pornographic contexts. Accessories such as razor blades and safety pins were applied to destroy the impression of a familiar, bourgeois-coded body shape and to demonstrate the danger of injuring the body while dressing. The garments and applied paraphernalia configured the surface of the body as the site of a provocative aggressiveness and violation (Leutner 2014, 322).

These examples show that although fashion design is considered a realization of application-based design, affordance is certainly questioned and reflected upon. One can see from the designs and also from punk fashion that they explicitly negate or transcend the notion of a dress oriented towards functions. Wearing dresses does not only semiotically point beyond covering the body. One can state that this everyday practice is about creating a "fashion body" (Lehnert 2013, 67). This fashion body constitutes an aesthetic sphere that strives for a significant relationship between object and body, in that both communicate with each other on a superordinate level and, if necessary, lead to a new gestalt, regardless of whether this is characterized by unity or by ruptures. This gestalt may be anticipated at the sight of a garment even before it is worn.

It is certainly a desideratum of fashion theory to further explore the contribution of affordances in this process. The cases listed should document that fashion design is primarily concerned with the reflection of affordances, rather than the design-based enhancement of the practicality of the objects in question. As in product design, however, the relationship between object and context of action must be explored in detail. The exploration of affordances thereby directs attention to the virulent, nonverbal constituted communications of artifacts, to which, in the case of dresses, an overdetermined bodily motif is added. The visible surface is transcended to the "inside" as well as to the "outside." The fashion body presents itself as a figure in the interrelationship of living body and artifact.

Conclusion

Gibson's concept of affordance should be understood against the background of its emergence from the context of Gestalt theory and ecological perception theory. Since the perception-theoretical concept of Gestalt has its roots in the literature and philosophy of the 18th and 19th centuries, a rethinking of its application to aesthetic phenomena would suggest itself, which would also take into account the critique of the claim to wholeness of Gestalt formulated in modernity. Gibson's notion of affordance has been embraced by recent design theory, but he has been controversial within perception theory. In the context of design, it opens up the possibility of illuminating the realm of complex interaction between user and object. Within fashion theory, the notion of affordances helps to focus attention on the interactions between bodies and artifacts that are not captured in language. Indeed, unlike product design, the question of clothing and fashion foregrounds the relationship between body and object. The critical reflection of affordances through contemporary fashion, through corresponding aesthetic works, and finally through questioning by fashion theory and aesthetics makes an important contribution to the further development of research in perception theory.

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Epistemic Affordances and Active Inference in Socio-Cognitive Design

Klaus Schwarzfischer

Abstract

Methodological problems arise when a special case is confused with the general principle. You will find *affordances* only for 'artifacts' if analysis is restricted to 'artifacts.' The general principle, however, is an 'invitation character,' which triggers an action. Consequently, an action-theoretical approach is recommended. Accordingly, humans are not passive-receptive beings but actively produce *action effects* that open up the world to us (through 'active inferences'). This 'ideomotor approach' focuses on the so-called 'epistemic actions,' which guide our perception as conscious and unconscious cognitions. Accordingly, the seemingly passive perception is dissolved into a multitude of epistemic actions (e.g. eye movements, tactile operations, etc.). The action theoretical approach of ›enactive cognition' takes into account that every form is consistently processualized. Thus, each 'Gestalt' is understood as the process result of interlocking cognitions of 'forward modelling' (which produces *anticipations* and enables *prognoses*) and 'inverse modelling' (which makes hypotheses about *genesis* and *causality*). These cognitions are fed by previous experiences of real interactions, which later change into mental trial treatments, which are highly automated and often unconsciously. Every object can have such affordances that call for instrumental or epistemic action. In the simplest case, it is the body and the facial expressions of our counterpart that can be understood as a question and provoke an answer/reaction. In the same way, our own body and facial expressions act as affordances to our counterpart. Thus, emotion is not only to be understood as expression (output) according to the scheme 'input-processing-output,' but acts itself as a *provocative* act (input). The reaction to this clarifies what kind of situation we are in. Any unclear situation thus shows *affordances to epistemic actions*. Consequently, artifacts are neither *necessary nor sufficient conditions* for affordances. Rather, they exist in all areas of cognition—from enactive cognition to embodied cognition and social cognition.

The Efficiency of a Systematic Approach

This paper argues from a design theorist view why artifacts are neither specific for *design* nor for *affordances.* Some readers might be perplexed by that, but their irritation will vanish—as this text progresses from prejudgments to solid knowledge. A short preliminary round should help to show to which extent this optimism is reasonable.

We often gain a methodical surplus, if we look for the simplest case of a phenomenon. Ideally, we generate a precise definition of an object, of which we have just had unrelated examples before. Mostly, the object needs to be resolved in its generative processes by an operationalizing—as Siegfried J. Schmidt proposes with regard to scientific theory (Schmidt, 2010). The *microgenesis* of those objects (in German *Aktualgenese*) consists of specific processes which are resulting in that object. In the context of design and aesthetics this may feel unusual, because of the fact that mostly artifacts are thematized there. In his dialogue 'Hippias Major,' however, Plato already made the point that it does not suffice to list beautiful things in order to understand the essence of beauty. In fact, we have to explicate the definite process which is the base of each and every aesthetic experience (Schwarzfischer, 2019). A similar problem can be found in design theory, also, where designed artifacts were focussed for a long time without a strict definition of the term 'design.' I showed that operationalizing is fruitful in this case also (Schwarzfischer, 2010 a and 2010 b[1]). The focus will change from artifacts (as possible results of processes) to interventions themselves (as processes which are definable by necessary and sufficient conditions).

What exactly will be the methodic benefit of that operationalizing? First of all, this is the crucial step from *description* to *explanation* of a phenomenon—and therefore, from story telling to science. The explanation may result in a process flow diagram, but formalization is optional. Even when no such model like a block diagram is generated, the understanding of the phenomenon now is fundamentally different. This progress means the step from a special case to the general principle. Before that, we just had single examples of something which we met in random situations. Now, we are able to adress the *possibility* space *of the phenomenon. Especially on 'design' an enormous difference shows up: We will no longer analyze exclusively artifacts (which are just a special case). The process of formation itself will be focussed (as the general principle). Then, any volitional action is a design problem because to define* 'design' as an

intervention seems to be the only option (according to Schwarzfischer, 2010 a and 2010 b). That action-theoretical approach is astonishingly productive as this paper develops. Similarly, this holds good for 'aesthetics,' although there is a traditional fixation towards 'artworks' which prevented those theories from unfolding actual explanatory force and/or noteworthy use of application. Essential for this would be the capability for prognosis and the concomitant *falsifiability* (which necessarily exeeds a description of the given). Both require a theoretical access to cases that did not occur yet, in terms of adressing the possibility space (from which prognoses can be derived). For aesthetics this was accomplished systematically by modelling the aesthetic experience itself as a microcognitive process instead of 'measuring' static artifacts (Schwarzfischer, 2019). As a result, it becomes apparent that the basic process of any aesthetic experience can be identified as an evolutionary learning reinforcement. Thus, any acting can produce an aesthetic experience (e.g. playing, dancing or thinking as well as alone as with others). Amazingly, in this field it was again an action-theoretical approach which based the operationalization—although the verdict of 'disinterested appreciation' dominated (and paralyzed) aestheticians for generations[2]. To escape that, we chose a finer-grained analysis. Thus, each perception dissolves in several *perceptual acts* as a feature of any active observer (like men and animals on the contrary to trees). Concrete perceptual acts are eye movements or tactile scanning, for example. We can interpret those perceptual acts as 'epistemic actions' (which do not aim to change the world but just derive information in order to optimize the cognitive model of the world)[3].

This paper aims to outline the general principle of affordances instead of attributing a 'stimulative nature' (German *Aufforderungscharakter*) to artifacts only—as widely spread in literature. A more systematical and historical view refers to active observers, which is why an action-theoretical approach may be productive again. As a result, the possibility space of affordances is much wider than one might think when reading the conservative analyzes of artifacts[4]. On closer consideration, the spectrum of affordances ranges from intra-psychic *microcognitions* to processes of *social cognition.* This is less surprising when reflecting that affordances is orignially a concept of cognitive sciences[5].

Roots of the Affordance Concept in Cognitive Biology

The term ›affordances‹ was coined by the perceptual psychologist James J. Gibson as widely known[6]. The idea of affordances, though, is a bit older than Gibson's references to the Gestalt psychologists Kurt Koffka and Kurt Lewin suggest. Especially the concept *Aufforderungscharakter* (as an 'invitation character' or a 'call to action') by Lewin is generally identical with 'affordances' and may therefore be rated as a parent[7]. Andrea Borsato (in press) goes into the differences:[8]

> […] both authors [Lewin und Gibson] emphasize that such a connection does not exist per se, but just for a specific subject in a specific situtation, because the postbox does not point per se to post a letter by its ›invitation character‹ or by its 'affordance' but just for a subject who wrote a letter and wants to get it delivered. Already J. J. Gibson clarifies that this parallelism isn't more far-reaching. After done action the object loses its ›invitation character‹ but not its 'affordance:' For Lewin, the postbox does not call any longer for action when the letter is posted, whereas for Gibson the postbox keeps its 'affordance' also when the posting is done.

This quotation explains why in design the affordance is closely coupled with artifacts. In design theory affordance is seen as an object feature (acc. to Gibson) and not as a subject disposition (acc. to Lewin). The postbox example highlights the difference because the 'invitation character' as a disposition has a dynamical history itself— the 'invitation character' arises by writing a letter and leaves by posting the letter. Whereas Gibson claims that an affordance exists in a stable manner over time. Hence, it is a feature of the postbox. This assumption is problematic as postboxes (like every object) initially obtain their functional role by the users socialization. And, indeed, Gibson indicates, that affordances presuppose specific processes of learning.[9] Isn't this inconsistent, when affordances require learning processes of the subject *and* are features of the object? This is not the place to clarify these contradictions in detail or to reconstruct the full history of the concept 'affordance' (particularly because other contributions in this volume address aspects of it). For our purpose it seems more productive to introduce a less known author who was a contemporary of Koffka and Lewin.

Jakob von Uexküll published his much-noticed book 'Theoretical Biology'[10] in 1920 and already in 1909 he introduced the term 'Umwelt'[11]. This phenomenal *lifeworld* of animals is species-specific and therefore different for each species, as each species reacts distinctively to different objects in its environment.[12] Refering to Immanuel Kant,[13] he argues that in the Umwelt of an animal exclusively those objects exist which can be perceived with the particular sensorium of that species and that for this species only these objects can have meaning at all. Although Uexküll rejected Darwin' s theory of evolution, his phenomenological inspired approach to the inner world (German *Innenwelt*) of animals gained wide influence to growing disciplines like animal psychology and ethology. For example, Konrad Lorenz underlines the relevance of learning processes for behaviour—but now, the animal acquires the 'invitation character' by exploratory action: "Jakob von Uexküll once said that all things in the 'world' (*Umwelt*) of animals are 'action things‹ (*Aktionsdinge*) (1909). This is particularly true of the objects with which an animal has made itself familiar through exploration, and has then 'laid ad acta' for later reference."[14] In this sentence, not just the behavioral scientist is speaking because Konrad Lorenz is a founder of *evolutionary epistemology* as well.[15]

Also in the context of affordances it is of special interest which knowledge is innate and which is only acquired through the experiences of the individual. That learning is mainly favored by two factors: First, the disposition of a biological observer system that every learning is subjectively experienced positively. Second, the disposition that this biological observer system is to be understood as a 'curiosity being,' as Lorenz calls it. From this wording, it becomes clear that these curiosity beings—be it humans or other animals—actively deal with their environments. By no means do they passively wait for an external impulse before responding to it (as the behavioristic stimulus-response scheme would provide). It is precisely this phenomenological perspective which places value on subjective experience that Konrad Lorenz already found in Uexküll. The latter refers to Kant, who explains the principle of the unrecognizability of the 'thing-in-itself.' Not only is the sensory equipment of a living being the reason why each species lives in its own Umwelt, which is fundamentally different from that of another species. In addition, there are the very different possibilities to act on this environment. The *perceptual actions* mentioned above also belong to these possibilities of action. Each of these perceptual actions can be understood as an

epistemic action, which resembles a question to the environment: If you do not ask, you will not receive an answer and thus far less information about the environment. The *effects of action* are an indispensable source of information that has been and is systematically underestimated by positivists. Many, if not most, aspects of things cannot be seen as long as the observer remains passive (think, for example, of the haptic qualities, the weight or the hardness of objects). Therefore, interaction with the environment is an essential method without which it is impossible to construct a comprehensive cognitive reality model. Gibson explicitly formulates the principle:[16] "We must perceive in order to move, but we must move in order to perceive." *Uexküll recognized this and formalized it in his 'functional circle,' thus laying an important foundation for biocybernetics.*

Internal world
of the Subject

new Circle (Reafference)

E   S

World of action
(Interoception)

World as sensed
(Exteroception)

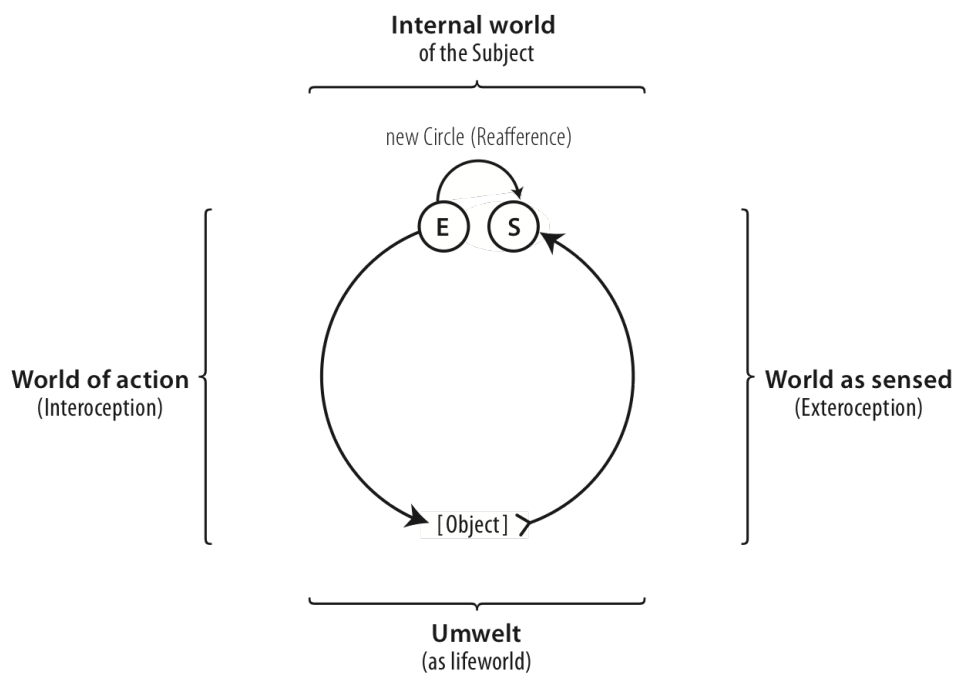[Object]

Umwelt
(as lifeworld)

Figure 1: The structural elements in the 'function-circle' due to Jakob von Uexküll, 1926, 157

(Source: own depiction from Schwarzfischer, 2019, 306)

The *function-circle* expresses the theoretical design of Uexküll, on which the biocybernetics of the 20th century is based. Essential is the differentiation into four distinct areas:

[1.] The 'Umwelt' (as the subjective environment) is everything that does not belong to the observer system itself (but e.g. the newborn human does not yet know what belongs to him or her and what does not).

[2.] At the center of the 'world of action' (as the effector world) is what is known as *efferent* nerves (these are the descending nerve pathways that lead from the brain to the muscles and that are necessary for action, i.e. for interacting with the environment). Because it is part of the activity, the physical self-perception of the actor (the 'interoception') belongs to the world of action. The world of effects pursues implicit or explicit goals, the realization of which is to be understood as 'top-down processes.'

[3.] The bottom-up processes in the ›world as sensed‹ (as the receptor world) work up the sensory input—based on the *afferent* nerve pathways (which run from the sensory periphery to the brain and which are the medium for noticing the environment). This is the perception of the outside world (the 'exteroception').

[4.] In evolutionary and developmental terms, the 'inner world' is the most recent area because it encompasses the higher cognitive processes of mental probing and conscious reflection. However, the elementary basic structures are significantly older. Basal is, among other things, the principle of 'reafference,' with which it is possible to distinguish, for example, whether the world has moved or whether I have only performed an eye movement. (Thereby the efferent muscle commands are set off against the afferent sensor signals, which the word 'reafference' expresses). Even complex memory structures are further developments of what is called the 'new circle' in figure 1. All effectors are grouped there as (E) and the (S) denotes the sensors. Schwarzfischer further developed the model (2019, 307–308). Thus, an 'inner world' can also be attributed to a counterpart in the environment, if this counterpart behaves *non-trivially* (so that this counterpart can be attributed with the control of behavior by intentions).[17]

Two Fundamental Perspectives on Affordances:
The Sensomotoric and the Ideomotoric Approach

In a way, Uexküll anticipates the 'pragmatic turn' in the cognitive sciences, as propagated by Andreas Engel, Karl Friston and Danica Kragic, 2015. This 'pragmatic turn' describes the paradigm shift from the 'sensorimotor approach' to the 'ideomotor approach.'

[s.] The *sensorimotor* approach is based on traditional cognitivistic thinking, which assumes a (quasi-)linear *input-processing-output* scheme. Accordingly, the sensory organs are the input that is processed centrally in the brain, resulting in an output (which either consists of a motor action or in a cognitive perceptual judgement, e.g. in an aesthetic or ethical evaluation). Primary is always the perception, which then leads to a secondary action—hence the name 'sensorimotor approach.'[18]

[i.] The *ideomotor* approach assumes an active observer, whose actions generate the observable phenomena as *effects of action*. For example, the infant recognizes only through its own movements (as 'ideomotor' means self-moving) what belongs to its body and what belongs to the environment. Similarly, observers only recognize the structured depth of the spatial arrangement when they act, as Gibson (1979, 123–125), shows with the help of flying birds. In general, according to the ideomotor approach, activity is primary and the perception of resulting action effects is secondary. Even the still undirected movements of an infant induce an input without which the development of higher cognitive structures would not be possible. This is called *embodied cognition* (because without physical action, cognition would not be possible) or *enactive cognition* (this is generating cognition because the activity itself generates action knowledge, relying on processes of self-organization rather than explicit knowledge or reflection).

This distinction is relevant for a comprehensive understanding of affordances, since two very different types of calls to action are evident: First, there are affordances to *react* physically to a given situation. This corresponds to the affordance concept in design, where real actions are triggered to change the situation (e.g. when a door handle has the affordance to open the door and enter the building).

This corresponds to an affordance to ›instrumental actions‹ as described above. Second, affordances to 'epistemic actions' (which do not aim to change the world) can be distinguished from those. Rather, they help to improve knowledge of the world. Information is not passively registered but actively *provoked*. Real interventions can be addressed as well as mental trial treatments or communicative inquiries in the social space.[19]

What exactly *provokes* an affordance that calls for action? It calls for interaction. But a concrete action (be it physical action, mental test treatment, or communicative simulation) presupposes a goal, which can be explicit or implicit. In the case of ›instrumental action‹ this goal represents a desired *state of the world*. In the case of the ›epistemic action‹, a *question to the world* is necessary, which is to be answered. In relation to the cognitive observer system three things can happen:

[1.]   A stimulus in the perceptual field suggests bottom-up a *goal* that is being considered (e.g. a deviation from the original intention, as children with Attention Deficit Hyperactivity Disorder experience everywhere). Here something is suggested *as a goal*.

[2.]   A perceived or imagined object may prove to be suitable as a *means* to achieve the goal that dominates the situation top-down (e.g. in an escalating marital dispute a cup is suddenly seen as a 'projectile'). Now the suitability *as a means* is determined.

[3.]   In the case of 'epistemic affordance,' the adressing of a role in a means-to-purpose relation is not that easy. The form of a statement (as a propositional sentence), which corresponds to the two varieties of the 'instrumental affordance' in [1.] and [2.], does not do justice to it. Rather, something approaches the observer in the form of *a question*, which can be answered in the next step by an 'epistemic action.' Accordingly such an action cannot be *falsified* as it would be possible in a statement. As a question it can only be accepted or rejected.

Relevant in evolutionary and developmental psychological terms is that such questions can be implicit or explicit. This is significant because in early stages only an implicit question is possible as a motivation for exploration. A biologically founded curiosity thus becomes the basis for any further development. Gerald Hüther shows why ideomotor activity has priority, even though the movements at first seem more random than arbitrary:

> From about the 7th week of pregnancy onwards, it can be observed how the embryo swimming in the amniotic sac performs its first, still very uncoordinated movements. Initially, these are rather twitches, which are triggered by the contraction of certain muscles of the trunk and extremities. [...] From the very beginning, learning takes place in the brain by using and exercising the corresponding bodily functions. In the course of this long and complicated learning process, the embryo is enabled to move its trunk, legs and arms in an increasingly coordinated manner [...]. What is true for the central nervous control of the body muscles is equally true— although less clearly visible or measurable—for the formation of all those neural circuit patterns that are involved in the control and coordination of all other body functions.[20]

Even the initially random movement of the embryo induces action effects that gradually make it possible to derive a cognitive body schema (which is still unconscious or implicit or embodied). Without this self-representation, it would be impossible to consider oneself later as an acting subject during mental trial treatments. First, one's own body must be appropriated to the extent that reliable *prognoses* of movements (as *anticipations* of action effects) are possible. Because they are embodied, these actions are always perceptible to others. Every action (whether it is sensorimotor-reactive or ideomotor-proactive) is thus public. Consequently, the production of affordances and the reactions to them are always both: they are of epistemological-embodied-cognitive interest (because ideomotor) and of action-theoretical-cultural relevance (because public).

Epistemic Affordances in Every Gestalt Perception

The action-theoretical paradigm represented here can also be applied to those areas that traditionally tend towards a passive observer. How this increases the explanatory value is to be shown with the simplest possible example. Furthermore, all complex scenarios are composed of its basic processes.
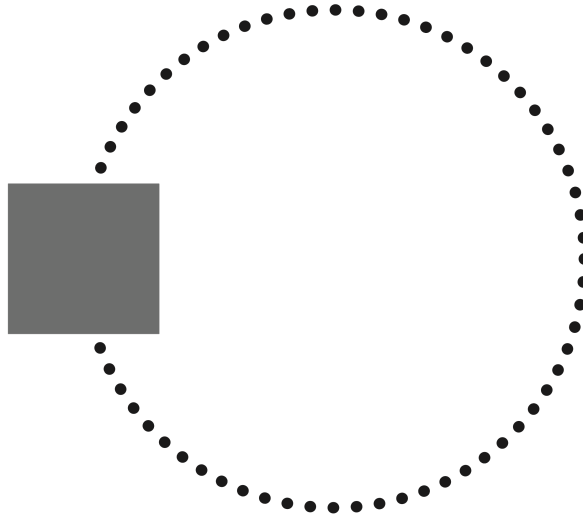
Figure 2: Simple example of a shape construction by the observer
(Source: own depiction from Schwarzfischer 2019, 83)

Why should we speak of a 'Gestalt-Construction' when we look at figure 2? The adult observer is usually not aware of any processes of ›construction‹. Rather, the ›content‹ of the image is immediately evident. But this impression is deceptive, because the supposedly given is an interpreted (and thus a *product*, something *made*) that differs considerably from what is actually seen (as sensor *data*). These deviations can be recorded quite precisely as processes of construction:

[1.] The 'circle' is no circle, because only an arrangement of single points can be seen in reality. Already the recognition of a regularity (a rotational symmetry) is put in by the observer as a cognition (based on unconscious conclusions).

[2.] The 'square' seems to lie on the circle and therefore hides a part of it. This also cannot be seen directly but is concluded. For the pixels of figure 2 are lying on one and the same plane (the paper), so there is no graduation of depth *within the figure*. This is added by the cognitive observer system by using probabilities that have developed and proven themselves in the empirical lifeworld (i.e. *outside of this illustration*).

[3.] This interpretation—that the 'square' lies on the 'circle'— creates another *fact* (done), which is not a *date* (given). The assumption that the 'circle' under the 'square' has the same regularity as the visible 'parts' is obviously a hypothesis and not a direct perception.

All three constructions, which were given here as examples, can be interpreted as unconscious cognitive processes on a very small scale. Such *microcognitions* underpin our entire life. All objects (not only the visual ones) are therefore to be understood as 'process results' of such microcognitions.[21] In adults, these processes run very fast, highly automated and unconsciously. They usually only become conscious when the results are unexpected, for example in the case of optical illusions, etc. The situation is different in infants and small children, where the learning processes are so slow that the external observer can, so to speak, 'watch them think in real time.' Here, ideomotor activity is slowly transformed into expectations of action effects, as described by Arvid Herwig, 2014. Enactive cognition plays the central role here because the action is primary and the ability to anticipate the *action effects* only gradually develops from it. This is exactly what happens unconsciously when we look at Figure 2. The ›spatial structure‹ of the elements is not seen but unconsciously calculated. These cognitive processes can be explained, as the contributions in Engel, Friston & Kragic, 2015, show. Furthermore, it can be shown that the enactive prior experiences are condensed to an aniticipative probability (which is called 'prior' in Bayesian reasoning). Each individual action changes this assessment depending on whether the expectation is confirmed or disappointed (which leads to the Bayesian 'posterior'—which is immediately used again as ›prior‹ for the next action). Without these interactions with the environment, learning that recognizes even the most elementary connections is not possible. In the famous study by Richard Held and Alan Hein

from 1963, young cats were raised in complete darkness. They were only able to see under controlled conditions (when light was on), forming two groups: One cat moved actively and the other cat was only passively moved by a device. The visual impressions in these bright learning phases were identical for both animals

 because they moved in the same way through the same scene. But those cats that were only passively moved did not learn to see. They moved in the test phase as if they were blind. In relation to our example in Figure 2, this means that even the microcognitive processes have to be learned under specific conditions. We can speak of *active inference* (i.e. active inference based on action effects), even though there is no reflected consciousness in the narrower sense yet.

The reality construction of every human being is full of interpretation based more or less on real sensor data. The process model of Schwarzfischer from 2019, refines the ›function-circle‹ by Jakob von Uexküll and extends it into a multi-level model. The process results of the active inferences have a very different range in spatial, temporal and factual terms. Therefore, at least three such levels have to be differentiated.[22] The 'conclusions' of the first-level active inferences are again used as ›premises‹ for the second-level active inferences, etc. In our example from figure 2, this means that here at the lowest level a perceptual hypothesis is formed, which would be tested in early childhood by a *real action*. Later on, a *mental trial treatment* is sufficient, which, if routine is sufficient, is automated and unconscious (so that we think we can 'see' it immediately without any cognitive effort, but it is actually an immediate knowledge or remembrance).

In this context, *affordances to epistemic actions* can be defined as all uncertainties that cannot be deductively derived from the cognitive reality model. Wherever only probabilities are involved (i.e. when the hypothesis character indicates that it could be different), a cognitive process is set up to check or complete the uncertain information (as in the example in Figure 2). Two types of such cognitive processes are important here: *Forward modelling* takes the current perception and forms hypotheses about possible future developments (e.g. the expected action effects of epistemic or instrumental actions). *Inverse modelling* forms hypotheses about possible causes (e.g. the history of the current situation). Put simply, two types of *affordances to epistemic actions* can be distinguished: Either the question 'What for?' Or the question 'Where from?' is provoked. Figure 1 can illustrate this because it combines temporal and structural aspects. Thus the arrows in the 'function-circle' represent a direction and thus a time axis, because it is a succession of events. At the same time, the areas represent structural units (e.g. the efferent nerves of the 'action world,' the afferent nerves of the 'perception world' and the brain-based working

memory of the 'inner world'). All events in the ›action world‹ are spun forward to their possible/probable effects in the 'perception world.'[23] Every phenomenon in the 'perception world' can be investigated by inverse modelling for its causes in the 'action world.'

Affordances in *design* often refer to the direct request for an instrumental action, which can be understood as forward modelling (because the means has an affordance towards the end). However, the design of affordances to epistemic actions is also a design problem (but is traditionally more associated with criminology, pedagogy or science). Since these are less 'world problems' than 'knowledge problems,' forward modelling and inverse modelling are equally common. Forward modelling is intended to make it easier for the ›process customer‹ to operate in the desired direction. Inverse modeling is intended to strengthen the understanding of causes and interrelationships—and in the next step to support desirable actions. 'Desirable' does not mean that a extrinsical target is internalized without reflecting this. On the contrary, especially if the autonomy of the subject is to be promoted, its ability to act and reflect must be increased. This is done by improving cognitive processes, which we can formalize as forward modelling and inverse modelling. Autonomy is improved if the subject is enabled to understand even complex process chains across several links and to assess their probability. This makes it more difficult to manipulate this subject by the proverbial 'dangling a carrot in front of somebody' or by too clumsy falsifications of history—because the stages of reflection range from enactive anticipation of immediate effects of action to theoretical reflections of possible worlds. There, logical investigations are carried out as epistemic actions. Even if *in* these possible worlds no instrumental action can be taken, instrumental actions are conceivable in our life-world, which are supposed to turn a possible world into reality. Every design fulfills this definition. Consequently, non-existent objects can have an affordance to epistemic *and* instrumental actions.

Emotional Expression as Affordance and Epistemic Action

At first glance, all actions in social space are public and thus observable by others. This is true for instrumental actions that are actually performed. For epistemic actions, though, this applies to a limited extent (think, for example, of mental trial treatment) as well as for instrumental acts of omission (such as the selfish concealment of information). A complete catalog of affordances that encourage such actions is not feasible here due to a lack of space. However, in introductions one aspect is regularly neglected when the artifacts are in the focus of media sociology.[24] Especially the subpersonal processes of enactive cognition deserve our attention because they typically occur automatically and unconsciously. They usually only enter consciousness when the course of action is disturbed.[25] An example can illustrate this: We go for a walk—either in the forest or in a lively old town. What is the difference between dodging trees and walkers? In a busy shopping mall, our bodies are in dialogue; in the forest, only I react to the static trees. The mutual affordances when avoiding passersby cannot be traced back to a linear scheme of 'input-processing-output.' Here we are dealing with circular processes because both are obstacles for each other and react to each other. Subliminally, we perceive finest approaches of evasive movements and tend to the other side.

Most of the time, this is done without conscious reflection. From time to time, however, it happens that both of us try to sidestep the same side, which can lead to exhilarating choreographies. This happens when the affordances of one actor are not felt by the other to be clear or unambiguous enough. In a busy pedestrian zone, passersby can by no means retreat to fixed rules, as is usually the case in automobile traffic. Each regulation must be ›negotiated‹ as an individual case (in the double sense of the word). This is not a rare special case that only occurs when strolling. Rather, the reciprocal negotiation of who occupies which semantic role in a concrete situation represents the normal case. Epistemic actions are used for this purpose, which in turn act as affordances on the counterpart.

Thus, Wendy Wilutzky, 2015, argues for a changed understanding of emotions that are not only the expression of a state of mind (which would correspond to the linear scheme of 'input-processing-output'). At least as important is the function of emotions in shaping the current situation. In this context, the emotion or facial/bodily expression is not seen as the output/result/end of a social interaction but its input/tool/start in the sense of an epistemic action. The social counterpart is forced to react to this emotion—whereby ignoring it also

represents a reaction that does not break off the sequence of events but only changes it. If emotions are interpreted in this way, they represent affordances for communicative action from which it is almost impossible to escape. In addition, emotional expressivity itself is to be understood as an epistemic action because a situation that was previously unclear is clarified by forcing a response/reaction. Here, also, evolutionary and developmental psychological roots can be found that go back a long way. For example, teenagers provoke a reaction from others—both in their peer group and at home—by varying degrees of expressivity (from feigned coolness to slamming doors). Only from this reaction, teenagers become clear about which roles they can sensibly grab in this structure. The 'handbag dog' of our neighbors (biologically it is a ›German Spitz‹) does it in a similar way, when it yelps at everyone and reads from the reaction its position in the social ranking, which it did not know before.

Of course, these examples are not only epistemic actions because there is always an attempt to not only get to know the social structure but also to actively shape it. This becomes clear when the will to shape is as lacking as curiosity about the world. The absence of affordances in depression not only paralyzes the affected individual because instrumental and epistemic actions are greatly reduced. In addition, the depressive sends out much fewer signals through facial expressions, which leads to systemic distortions in his or her environment, as Keith Dixon and Hans-Ueli Fisch (1993, 30) quantitatively demonstrate. As a result, the depressive in turn stimulates little reactions because of offering few affordances. This lack of responsiveness of depressives is problematic from an evolutionary and development-psychological point of view since a central basis of *social cognition* thus fails. All primates use 'social referencing' to pass on semantic ratings (the so-called 'valence') to infants and toddlers through facial expressions.[26] The children always cast a casual glance at their mother, who reacts with an encouraging smile or a serious facial expression.This non-verbal response signals that a 'good' or 'bad' situation exists and regulates the child's behavior. In one study, the children moved the least far away when the mother made a 'fear face' and the furthest when the mother radiated 'joy.'[27]

Social referencing can therefore be regarded as epistemic action. Both parts of this dialogue of non-verbal questioning (as an epistemic action to obtain information) and mimic response (as an instrumental action to control the child) fulfill the criteria of affordance. This is because the behaviors are used to provoke a specific reaction by the counterpart. Thus, social referencing can be understood as an evolutionary and development-psychologically very old form of affordance. At the same time, it is an example of how social situations are shaped by affordances that do not require artifacts as carriers. Thus, artifacts are neither a specific feature of design nor of affordances—as claimed in the introduction.

Author Biography

Klaus Schwarzfischer, Dr. phil., began his career as a multimedia artist and communication designer. He later studied information design at Donau-Universität Krems and was awarded the *Young Academics Achievement Award* of the Society for Gestalt Theory and its Applications (GTA) for his master thesis in 2015. In 2019, he received his doctorate in media sciences from the University of Tübingen under supervision of Klaus Sachs-Hombach. Klaus Schwarzfischer's main research interests are cognitive semiotics, Gestalt psychology, design theory, and empirical aesthetics. In addition, he was a member of the advisory board of the German Society for Semiotics and head of the design section from 2005 to 2019. Relevant book publications (in German): *Reality as a Design Problem* (2008), *Transdisciplinary Design* (2010), *Integrative Aesthetics* (2014), *Empirical Aesthetics* (2016) and *Aesthetics of Reality Construction: How Are Competing Aesthetic (Design) Preferences Possible? A cognitive-semiotic approach* (2019). Email: ks@indukt.de

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Notes

[1] This connection was first presented by Schwarzfischer at a talk about ›A Systemsemiotic Approach to Design‹ at EAD06, 6th European Academy of Design in Bremen, March 29th 2005.

[2] Sauer, 2014, extends the arts to the wider scope of pragmatism. Whereas, Schwarzfischer, 2019, completely leaves behind the arts, when combining the act-theoretical approaches of Piaget, 1972, and Lorenz, 1982. The resulting account is plausible from phylogenetic as well as ontogenetic perspectives.

[3] Kirsh & Maglio, 1994, distinguish ›epistemic action‹ (which aim at a gain of knowledge about the world) and ›pragmatic action‹ (which target to produce a specific state of the world). From a semiotic point of view we better do not speak of ›pragmatic action‹ here because any action has pragmatic aspects. Therefore, I will call them ›instrumental actions‹ instead of ›pragmatic actions‹. This differentiation is relevant for ›design‹ as we noted above: Hence, any intervention is design. In technical terms, shaping the world means that we try to realize a target state—this means, we apply an ›instrumental action‹. To get the actual value (and to decide whether it is different from the target value) we need an observation (which is formally a measurement of any kind). This is an ›epistemic action‹ which can be very simple or rather complicated (e.g. as an *experimental design*). It shows that the distinction by Kirsh & Paul, 1994, is an analytical one, because in everyday life both types occur combined. For example, any experimental design (as an ›epistemic action‹) needs several ›instrumental actions‹ to be realized and to work.

[4] For example: Norman, 1988, 1993 and 2018; Jacob & Wisch, 2006; Humphrey, 2010; Fox, Panagiotopoulos & Tsouparopoulou, 2015.

[5] The cognitive scientist Norman, 1993: 139ff., analyzes affordances with respect to ›distributed cognition‹. He demonstrates how affordances are used to minimize cognitive load and user errors. The targeted anchoring of affordances in a situation is unburdening the user, why it is also called ›cognitive offloading‹—see Dror & Harnad, 2008, or Grinschgl et al., 2020.

[6] Gibson, 1966, 285.

[7] Lewin, 1926, 28 and 59–62.

8 Borsato (2021, in press); translation by Klaus Schwarzfischer.

9 Gibson, 1966, 285

10 Uexküll, *Theoretische Biologie*, [German Edition], 1920; Uexküll, *Theoretical Biology*, [English Edition], 1926

11 Uexküll, 1909, *Umwelt und Innenwelt der Tiere*.

12 Uexküll, 1934, 47–48, tries to reconstruct the ›first-person-perspective‹ of animals to be able to grasp their subjective reality: He speaks of the ›sitting tone‹ (which a basket has for a dog), the ›climbing tone‹ (which a ladder emits), and the ›beating tone‹ (which an object emits for someone looking for a weapon). This is clearly reminiscent of Koffka, 1935, 7: »To primitive man each thing says what it is and what he ought to do with it: a fruit says, ›Eat me‹; water says, ›Drink me‹; thunder says, ›Fear me‹, and woman says, ›Love me‹.« Who has taken over this affordance concept from whom can remain open here. Because of his phenomenological methodology and his closeness to Gestalt psychology, Harrington, 1996, has dedicated an entire chapter to Uexküll.

13 Kant, 1781, *Kritik der reinen Vernunft*.

14 Lorenz, 1982, 328. In the German version of this sentence, Konrad Lorenz, 1978, 259–260, speaks explicitly of ›Neugierwesen‹ (*curiosity beings*).

15 Lorenz, 1978, *Behind The Mirror*.

16 Gibson, 1966, 223

17 This attribution means that these are non-trivial systems according to Heinz von Foerster, which provide different outputs despite the same input—see Foerster & Pörksen, 2002, 54–57.

18 In the present context, the term ›sensorimotor‹ should not be confused with the term Piaget, 1972, 20–31, uses in his genetic epistemology for the first phase of life, which he also calls ›sensori-motor‹ In fact, however, Piaget is referring to what is called ›ideomotor‹ in more recent literature. The conceptual differentiation between ›sensorimotor‹ and ›ideomotor‹ was not yet established in Piaget's time, although the principle can be traced back to James, 1890, see Stock & Stock, 2004.

19 Consequently, both ›instrumental actions‹ and ›epistemic actions‹ can occur in all three spheres, which the technology philosopher Hubig, 2006, 141–142 and 241, distinguishes: The cognitive *intellectual technique*, the physical *real technique* and the institutional *social technique*. Hence, all three areas are fields that can be designed-—and must.

20 Hüther, 2017, 83–84 [translation by KS]

21 See Schmidt, 2010, 104–105

22 In the *lifeworld*, however, even finer differentiations are necessary, so that Schwarzfischer 2019, 317, proposes a ›normal version‹ of the process model with eight levels each in the top-down pathway (the world of action) and the bottom-up pathway (the world as sensed).
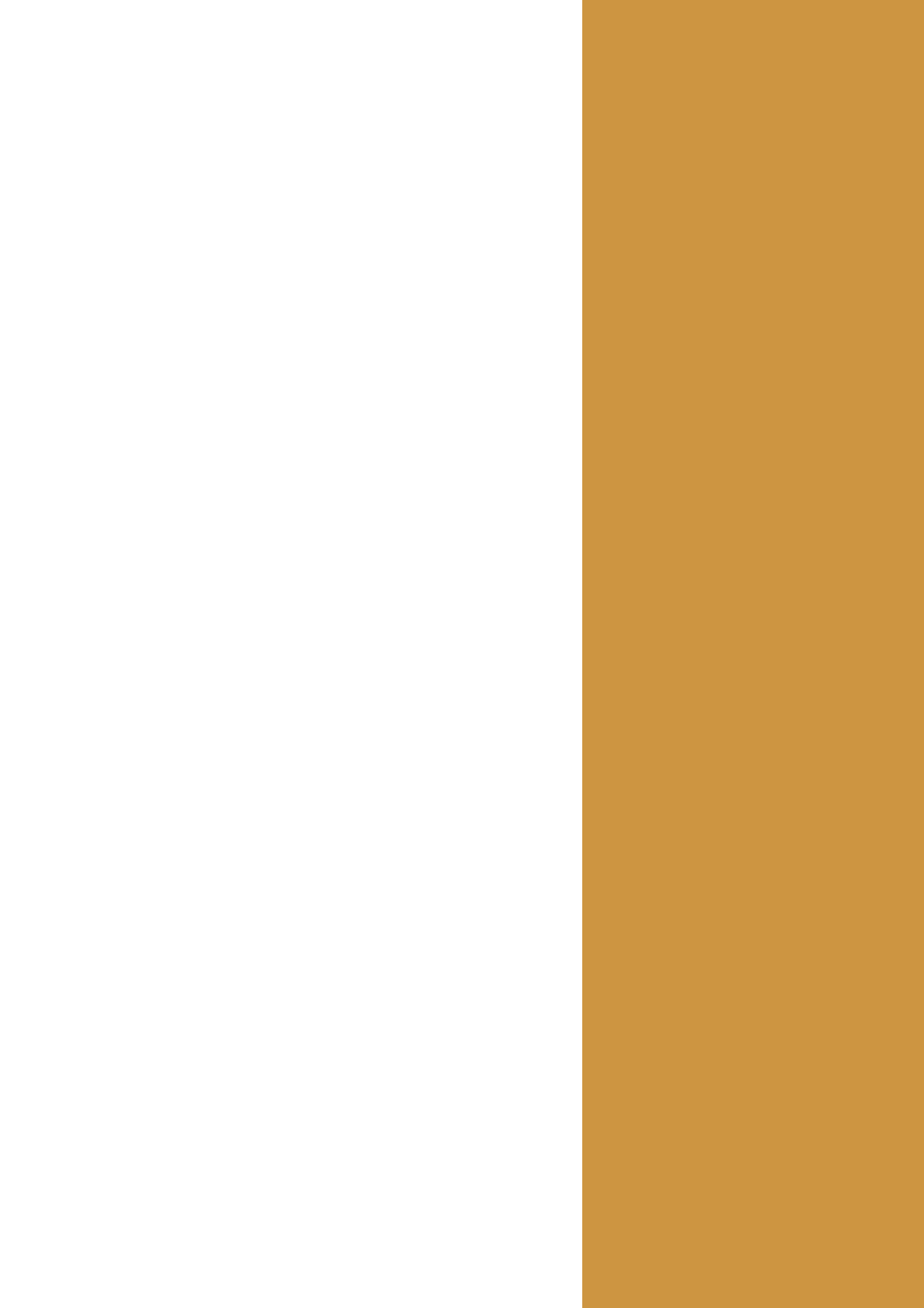
23 This is the basis of ›reafference‹, as described by Lorenz 1982, 63, by reference to rats that are frustrated when the expected action effects do not occur although the action is performed.

24 For example, see Zillen, 2008

25 For more detailed information, please refer to the ›inquiry cycle‹ by Dewey, 1938. This can shed light on scientific problems as well as on everyday irritations in the course of the action. A visualization with detailed explanation can be found in Strübing, 2014, 43, and Schwarzfischer, 2019, 129–130.

26 Höhl & Pauen, 2015, show that the social dimension already plays a major role in learning in infants (e.g. *joint attention* and *social referencing*, in which the observed facial expressions of the other person assign an object its valence). A ›fear face‹ of the mother assigns a negative valence to the object, whereupon the infant does not approach the object further. A mother's smile assigns a positive valence to the object and the infant continues to approach the object with encouragement. This observation disproves the common saying »Burned child shuns fire« at least in important parts. This is because the assumed direct interaction with the object does not have to have taken place at all since the assignment of the valence is already done at sight through *social referencing*.

27 For details of this study see Klinnert et al., 1983, 67

Electronic Imagery in Experimental Film: The Affordances of the Oscilloscope

Stefanie Bräuer

Abstract

This article focuses on electronic imagery in experimental film, and specifically examines the usage of the oscilloscope. The images generated by this electronic testing and measuring device reflect the techno-material setting in which they were produced. Their implementation in experimental filmmaking demarcates a site where electronics and cinematography meet. In order to better understand this arrangement and to identify certain practices afforded by this social and material environment, this article follows a specific understanding of the concept of affordance. Depending on the field, affordance has been framed in a multitude of ways, amongst others as a prescriptive design tool. However, outlining the concept as descriptive, instead of prescriptive, and focusing on its material and relational dimension is better suited to an analysis of how the oscilloscope has been used in filmmaking. By highlighting the material, functional, relational features of the concept, this article focuses on how this socio-technical arrangement enables specific uses. The aim is to determine affordances for a set of oscilloscopic and filmic practices: What does the electronic oscilloscope, understood as bound in a socio-technical environment, afford experimental filmmakers? First, I will lay out the term affordance with a focus on the ways in which electronic imagery can be produced by means of an electronic oscilloscope in order to specify the afforded practices in a second part. In the third and last section, I will present a specific example of an experimental film that incorporates oscilloscopic imagery, *Around Is Around* directed by Norman McLaren in 1951, tying it back to the concept of affordance developed earlier.

Affordance

The psychologist James J. Gibson introduced the term *affordances* in derivation from the verb to *afford.* He explicated it in a chapter titled 'Theory of Affordances' as part of a book on the ecology of perception, where the term concerns the interaction between animals or humans and their environment.[1] Gibson has been involved in researching visual perception since the 1920s and refers to the work of Gestalt psychologist Kurt Lewin who developed associated terms within the framework of field theory: "The concept of affordance is somewhat related to these concepts of valence, invitation, and demand but with a crucial difference. The affordance of something does not change as the need of the observer changes."[2] Here, Gibson locates Lewin's notion with the observer while positioning his own concept between observer and environment: "An affordance cuts across the dichotomy of subjective-objective"[3]. Hence, he conceives affordance as relational in order to overcome the dualism of the observer and the observed, assuming an environment shared by both.

Donald Norman adopted the term for practical product design, putting aside the relational aspect. He defined affordances as product properties triggering specific uses which should be addressed already during the design process, bearing in mind the product's later usability: "*affordance* refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used…. When affordances are taken advantage of, the user knows what to do just by looking"[4]. This shift in the term's usage towards product design and, since the 1990s, software and interaction design shaped the understanding of affordance as a prescriptive design tool rather than as a descriptive category, as initially suggested by Gibson. Norman later acknowledged that he should have restricted his own usage of the notion specifically *to perceived affordance.*[5] Nevertheless his take on affordance became prevalent within Human-Computer Interaction.[6]

In media studies, both readings gained traction, often without clarifying whether the descriptive or the prescriptive dimension was relevant. For example, in a text on actor-media theory, Tristan Thielmann and Jens Schröter refer to Madeleine Akrich's script approach. In the context of actor-network theory, script refers to instructions on the use of a technical object. Thielmann and Schröter mention *affordance* to be an alternative term to *script,*[7] and thereby implicitly derive *affordance* from Donald Norman's prescriptive approach. In media ecology, however, authors prefer to reference James J. Gibson's descriptive take on the term, both implicitly, such as Jussi Parikka, and explicitly, e.g. Matthew Fuller. In

2011, Parikka suggested the possibility of "media history as a history of affordances".[8] This would presume media technology as an active entity within the circulation of matter, energy and meaning.[9] Parikka cites Matthew Fuller's 2005 book *Media Ecologies*. For Fuller, Gibson's work on the ecology of perception is an important point of reference, especially in regard to the relational and anti-essentialist dimension of the term *affordance*. "The advantage of his [Gibson's, A/N] work is that it takes up the possibility of detailed exploration of the material qualities of things-in-arrangement, rather than of their essence."[10] Even though there is research on non-material imagined affordances,[11] media ecology's focus on materiality and relationality allows to consider concrete practices involving technical imagery.

In what follows, I'll refer to the affordances of the material oscilloscope-user-arrangement in terms of Fuller's and Gibson's take on it, in conjunction with Ian Hutchby's sociology of science approach. In *Technologies, Texts and Affordances*, Hutchby mediates between the seemingly mutually exclusive alternatives of social constructivism and technological determinism. According to Hutchby, affordances are functional and relational aspects of a technical artifact that frame, rather than determine, the possibilities for interacting with it. For Hutchby, functionality points to enabling certain operations and limiting others, while relationality focuses on the interdependency between the technical object and the user, including the notion that some possible operations might be relevant to some users and irrelevant to others.[12] The emphasis on the relationality of affordance benefits the description of the production processes that led to the early 1950s experimental films in question as embedded in a specific social and techno-material environment.

The Oscilloscope's Electronic Imagery

The oscilloscope, understood as embedded in a socio-material arrangement, affords a set of practices: (1) rapid visual display and analysis of dynamic phenomena, (2) modification of parameters in real-time, (3) generation of specific regular shapes – so called Lissajous curves – and (4) the storage of these volatile electronic images through opto-chemical means, i.e. photography and film.

The oscilloscope has its origins in the context of gas discharge and cathode ray research of the 19th century as well as in tool making for self-recording instruments. In 1897, the physicist Ferdinand Braun employed a specially prepared evacuated glass tube for the visualization of alternating current.[13] This specific cathode ray tube (CRT) was to become the oscilloscope's main component and, in a more involved setup, the picture tube of later television sets. The purpose of Braun's initial self-registering apparatus was to record otherwise invisible electrical current. The working principle is the cathode ray beam's control through deflection coils connected to the current which is to be visualized. The beam originates from a cathode and is composed of negatively charged electrons that are pulled towards a positively charged anode. A pinhole mask focuses the beam before it hits the phosphorescent screen, creating a spot of light. The beam may be deflected electrostatically or electromagnetically, moving the light spot accordingly. With the advent of radio in the 1920s, alternatives to Braun's electronic setup, such as mechanical oscillographs, proved to be too slow for adequately displaying oscillations in the megahertz range.[14]

Figure 1: Heathkit oscilloscope model O-12 with 5-inch tube, ca. 1958.
Photo by the author. Licensed under CC BY-NC-SA 4.0.

The oscilloscope's (1) rapid visual display allowed for the analysis of high frequencies without any time lag or self-oscillations of the measuring device (fig. 1). The electronic oscilloscope was, and still is widely used for measuring, testing and maintenance in electrical engineering, as well as for demonstration purposes in class room settings. Aside from high oscillations, low frequencies can also be displayed, such as those derived from sound, after its transformation into electrical current by means of a microphone. As oscilloscopic sound visualization happens in real time, the audible and its visible counterpart appear to be closely related and point towards their integration within the audiovisuality of electronic media.

The oscilloscope not only lends itself to the visualization and analysis of dynamic phenomena, such as sound, but also to the (2) adjustment of parameters on the fly. In addition to switching between external signal sources as well as their alteration through gain controls, the modification of the horizontal sweep and of the beam's position, intensity and focus, effect the display very quickly. As the oscillatory images are free of inertia and respond rapidly to changes of a given setting, the interaction with them happens in real-time. Reactivity and real-time interactivity result in a feedback loop that both the user and the device engage in during the generation of visuals.[15]
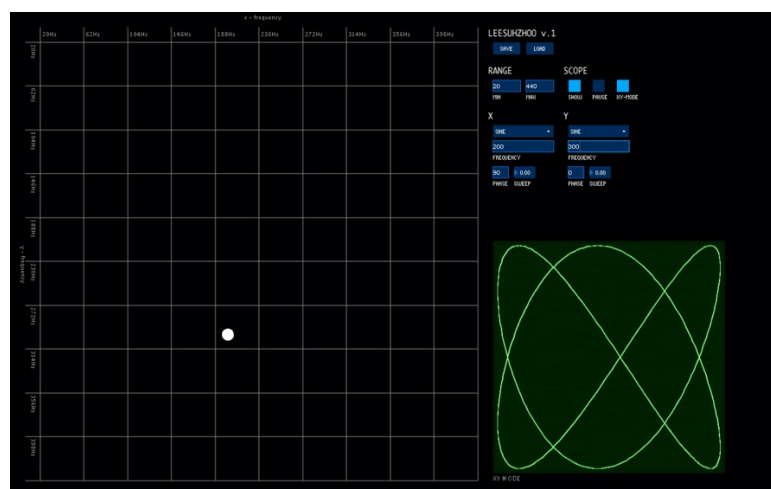

Figure 2: Ted Davis, Leesuhzhoo, 2015/2020, screenshot of application,
Lissajous curve at frequency ratio of 3:2. "Leesuhzhoo,"
Github, accessed January 8, 2021, https://github.com/ffd8/leesuhzhoo.
Licensed under CC BY-NC-SA 4.0.

These electronically realized visuals are two-dimensional function graphs.[16] The oscilloscope allows both the depiction of a signal plotted against a linear time base, generated through a built-in sawtooth oscillator causing a horizontal sweep, as well as plotting a signal against a second variable signal. If their mathematical relation is harmonic, (3) regular closed curves, so called Lissajous curves, may be generated. In engineering, oscilloscopic Lissajous patterns proved to be valuable for frequency determination,[17] as they visually facilitate the identification of an unknown frequency in comparison to a known one. The variety and regularity of these patterns has prompted their study from contexts outside of an applied usage. *Leesuhzhoo* is a tool built in Processing by media artist and designer Ted Davis that allows for the exploration of these geometric dual-frequency plots.[18] The tool enables the user to move a two-dimensional slider within a coordinate system to adjust frequencies. It offers a preview, emulating an oscilloscope screen and generates audio output that may be fed to the two input channels of an analog oscilloscope set to XY-mode. A set of controls alter wave shapes and frequency ratios, such as the Lissajous curve in figure 2 which is based on two sine waves at the frequency ratio of 3:2.

The oscilloscopic real-time imagery is volatile and therefore (4) requires storage through opto-chemical means, such as photography or film. Pointing a camera at the CRT-screen and recording the patterns was common in engineering. Camera-screen-compounds branched out into various special equipment, such as Stromberg-Carlson's S-C 4020 microfilm plotter, investigated by Zabet Patterson in relation to 1960s and early 1970s computer art.[19] In the case of electronic oscillography and its filmic records, in the early 1950s three experimental filmmakers – Mary Ellen Bute, Norman McLaren and Hy Hirsh – tinkered with the engineering practice of documenting the oscilloscope screen and combined it with their own approach of setting abstract animated patterns to music. Of the resulting colorful *Visual Music-films, Around Is Around* shall serve as a case for closer examination in the last section.

Oscillograms for the Experimental Film Around Is Around

Around Is Around[20] is an experimental animation incorporating electronic imagery photographed from the oscilloscope. It was directed in 1951 by Norman McLaren who, at the onset of World War II, emigrated from London to New York and in 1941 moved to Ottawa, where he worked at the National Film Board of Canada (NFB) until shortly before he passed away in 1987. He received assistance in the production of Around Is Around by Evelyn Lambart, who worked as letterer, animator and director at the NFB from 1942 until 1974, and by Chester Beachell, who had a radio engineering background and worked at the NFB's technical research division from 1949 until 1980. The Lissajous curves integrated into the film are devoid of a narrative structure and behave as autonomous figures moving in accordance to music by Louis Applebaum, set in front of hand-drawn backgrounds.[21] The synchronization between the musical and visual movement is on point. The oscilloscopic curves are presented as spinning around their own axis, which is due to a deliberate phase shift between the frequencies. Rotation lends itself to stereo-optics: *Around Is Around* is a 3D-film. The occasion for its production was the 1951 *Festival of Britain* in London. The festival was meant to attain national self-assurance after the dismantling of the British Empire. It involved contributions by Canada, as a member of the Commonwealth, including films by the National Film Board of Canada. *Around Is Around* employs polarization stereoscopics and was screened as part of the *3D program* at the Telecinema, a London theater built especially for the Festival that featured a stereoscopic projection system, and a multi-channel sound system.[22] These specific parameters required consultation by the technical research department, NFB's research and development unit.

Chester Beachell assisted McLaren and Lambart during the production, initially for the stereoscopics that were based, not on three-dimensional objects, but on flat artwork.[23] Beachell's work was later reflected in a publication on the development of a stereo camera system.[24] Another outcome of the collaboration was stereoscopic oscillography, as prominently employed in *Around Is Around*. An article by McLaren and Beachell, published in a technical journal shortly after the film's premiere, helps in retracing the appropriated use of the electronic oscilloscope for experimental filmmaking.[25] Among other aspects, the authors go into the production of the electronic oscillograms. They mention the oscilloscope's tube, as it featured the relatively long afterglow of green phosphor[26] and therefore was nearly unsuitable for filming: "Due to the low actinity of the phosphor used – the oscillograph tube was a 5LP1 – it was necessary to shoot at varying frame rates

depending on the complexity of the pattern. This was also an advantage as it permitted *greater manual control* of the figure during shooting."[27] Considering Ian Hutchby's understanding of functionality as a main aspect of affordance, the tube limited rapid camera speeds due to its actinity and enabled other operations, in this case a detailed control of the images materializing on the tube's screen and their careful filming through lower frame rates.

These conditions of filming the screen present a specific case of affording (4) storage of volatile electronic imagery, while the emphasis on adjustability points to the abovementioned affordance (2) of on-the-fly modifications. The authors write: "The growth and change of the patterns were controlled by manually operating the control knobs on the oscillographic setup."[28] They specify these controls comprising vertical and horizontal gain, as well as mixing, phase-shift and rotation controls,[29] that were applied to vary the fundamental sinusoidal, square and saw-tooth wave shapes generated by oscillators.[30] The resulting Lissajous patterns were put into horizontal rotation by shifting the frequencies' phase, which allowed for stereoscopy: "The movement of the patterns was kept predominantly horizontal, so that the monocular dynamic parallax would produce binocular parallax, when two identical prints were staggered as a stereo pair."[31] Parallax in this case refers to the difference of location between a left-eye print and the respective film images of the right-eye print. As the two film prints were identical and merely presented slightly off-set, McLaren's and Beachell's use of Lissajous curves proved to be a low-budget procedure for creating a 3D-effect. As stereo-optics is not usually part of oscilloscopic imagery and obtained relevance only in this particular setting of preparing a stereoscopic film for the *Festival of Britain's* 3D program, this appropriation of an electronic measuring device for alternative purposes points to Ian Hutchby's notion of relationality as a major aspect of affordance. As mentioned above, operations might be relevant or irrelevant, depending on a technical object's user which underscores the mutual interdependency. The fact that the oscilloscope affords (3) the generation of rotating Lissajous curves, resulted in in the stereoscopic film *Around Is Around*, engendered through this specific production context.

Conclusion

In analyzing the oscilloscope-user-arrangement as a social and material environment while following the descriptive understanding of affordance, I highlighted the material, functional, and relational features of the concept. Functionality and relationality are main aspects of affordance, as laid out by Ian Hutchby. Regarding relationality, the oscilloscope-user-arrangement affords a set of practices that present themselves with varying degrees of relevance to different users. The afforded practices include (1) displaying and analyzing dynamic values rapidly, (2) real-time interactivity, (3) generating Lissajous curves, and (4) storing these volatile images on film. The relationality becomes apparent in that the (1) analysis of dynamic phenomena is important to engineers, while it is secondary from a filmmaking perspective. Furthermore, whereas the (4) documentation of electronic images on film most likely poses itself as a mere necessity in an engineering context, it is appreciated as a ground for further exploration by experimental filmmakers. In the case of Norman McLaren's, Evelyn Lambart's, and Chester Beachell's work on *Around Is Around*, (3) the creation of regular geometric shapes set in rotation lends itself to a new method for obtaining an inexpensive stereoscopic effect. Therefore, this animation presents itself as a telling case of an experimental film integrating the oscilloscope's electronic imagery, and thereby the affordances of a specific socio-technical and material setting in the course of its production process.

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Notes

[1] James J. Gibson, *The Ecological Approach to Visual Perception*, rev. ed. (New York: Taylor & Francis, [1979] 1986). The following quotes are referring to a preprint of this chapter as part of an edited volume published in 1977: James J. Gibson, "The Theory of Affordances," in *Perceiving, Acting, and Knowing. Toward an Ecological Psychology*, ed. Robert E. Shaw and John Bransford (Hillsdale: Lawrence Erlbaum, 1977), 67–82.

[2] Gibson, "The Theory of Affordances," 78.

[3] Gibson, "The Theory of Affordances," 70.

[4] Donald A. Norman, *The Design of Everyday Things*, rev. ed. (New York: Currency Doubleday, [1988] 1990), 9.

[5] Donald A. Norman, "Affordance, Conventions, and Design," *Interactions* 6, no. 3 (May 1999): 38–43, 39, https://doi.org/10.1145/301153.301168. Norman refers to Gibson's approach in a footnote where he also indicates his unwillingness to follow Gibson's idea of relationality. Norman, "The Design of Everyday Things," 219, footnote 3.

[6] Regarding the importance of Norman's approach for HCI, a 1991 article on technology affordances may be cited exemplarily: "The role of a good interface is to guide attention via well-designed groups of sequential and nested affordances." William W. Gaver, "Technology Affordances," *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 1991, 82.

[7] Tristan Thielmann and Jens Schröter, "Akteur-Medien-Theorie," in *Handbuch Medienwissenschaft*, ed. Jens Schröter (Stuttgart: Metzler, 2014), 148–158, 150.

[8] Jussi Parikka, "Media Ecologies and Imaginary Media: Transversal Expansions, Contractions, and Foldings," *Fibreculture Journal. Issue on Unnatural Ecologies*, no. 17 (2011): 34–50, 43.

[9] "[H]ow can matter circulate energy and meaning? Does this suggest the idea of media history as a history of affordances? Could we look at media technologies as active furnishings of 'what-ever-can-be-done' in terms of seeing, hearing, moving and relating, for example?" Parikka, "Media Ecologies and Imaginary Media," 43.

[10] Matthew Fuller, *Media Ecologies. Materialist Energies in Art and Technoculture* (Cambridge, MA: MIT Press, 2005), 45.

[11] Nagy, Peter, and Gina Neff, "Imagined Affordance: Reconstructing a Keyword for Communication Theory," *Social Media + Society* (2015): 1–9.

[12] Ian Hutchby, "Technologies, Texts and Affordances," *Sociology* 35, no. 2 (May 2001): 441–456, 444, https://doi.org/10.1177/S0038038501000219.

[13] Ferdinand Braun, "Ueber ein Verfahren zur Demonstration und zum Studium des zeitlichen Verlaufes variabler Ströme," *Annalen der Physik und Chemie* 60 (1897): 552–59.

[14] Jacob H. Ruiter Jr., *Modern Oscilloscopes and Their Uses* (New York: Murray Hill Books, 1949), 12.

[15] Regarding games, Inge Hinterwaldner suggested to identify the act of playing – the linkage between player and game – as a cybernetic system, as opposed to the program-based rules structuring the game. Inge Hinterwaldner, "Programmierte Operativität und operative Bildlichkeit," in *Die Kunst der Systemik. Systemische Ansätze der Literatur- und Kunstforschung in Mitteleuropa*, ed. Roman Mikuláš, Sibylle Moser, and Karin S. Wozonig (Wien: LIT, 2013), 63–94, 67.

[16] Bernhard Siegert, *Passage des Digitalen. Zeichenpraktiken der neuzeitlichen Wissenschaften 1500–1900* (Berlin: Brinkmann & Bose, 2003), 390; Wolfgang Ernst, *Chronopoetik. Zeitweisen und Zeitgaben technischer Medien* (Berlin: Kadmos, 2012), 150–51.

[17] For a visual reference chart, please see the respective section on frequency determination in Merwyn Bly, *A Guide to Cathode Ray Patterns* (New York: John Wiley & Sons, 1943), 6–13.

[18] Ted Davis: *Leesuhzhoo*, 2015/18. "Leesuhzhoo," Github, accessed January 8, 2021, https://github.com/ffd8/leesuhzhoo. Leesuhzhoo is open source and may be developed upon.

[19] Zabet Patterson, *Peripheral Vision. Bell Labs, the S-C 4020, and the Origins of Computer Art*, (Cambridge, MA: MIT Press, 2015).

[20] The film is property of the National Film Board and has been licensed for distribution on the Blu-Ray *3-D Rarities* by the 3-D Film Archive in 2015. "3-D Rarities," 3-D Film Archive, accessed January 8, 2021, http://www.3dfilmarchive.com/3-d-rarities.

[21] Norman McLaren and Evelyn Lambart, *Around Is Around*, 1951, color, sound, 3D, 35mm, 10', oscillograms by Chester E. Beachell. A film still on the website of the National Film Board of Canada shows a Lissajous pattern at the ratio of 3:2, the basis for the recreation in *Leesuhzhoo* (fig. 2), "Around Is Around," National Film Board of Canada, accessed January 8, 2021, https://www.nfb.ca/film/around_is_around.

[22] A second *Festival of Britain*-contribution by Norman McLaren and Evelyn Lambart served as a prompt to the audiences to put on polarized glasses at the start of the 3D-program: *Now is the Time (to Put on Your Glasses)*, 1951, color, sound, 3D, 35mm, 3'. Raymond Spottiswoode, "Progress in Three-Dimensional Films at the Festival of Britain," *Journal of the Society of Motion Picture and Television Engineers* 58, no. 4 (April 1952): 291–303, https://doi.org/10.5594/J01197.

[23] In a chronology of his work, the scriptwriters of an unrealized documentary about Beachell list the following for the year 1951: "The 3-camera 35mm multiple camera control system. Assisted Norman McLaren in his 3-D productions 'Now Is the Time' and 'Around Is Around'." Martin Defalco and Douglas Cameron, "Story Outline for 'Ches Beachell – Portrait of an Inventor,'" box 12425, folder *Biographic File Chester E. Beachell*, Archives of the National Film Board of Canada (October 1980): 1–5, 2.

[24] Chester E. Beachell, "A 35mm Stereo Cine Camera," *Journal of the Society of Motion Picture and Television Engineers* 61, no. 5 (November 1953): 634–41, https://doi.org/10.5594/J00969.

[25] Norman McLaren and Chester E. Beachell, "Stereographic Animation. The Synthesis of Stereoscopic Depth From Flat Drawings and Art Work," *Journal of the Society of Motion Picture and Television Engineers* 57, no. 6 (December 1951): 513–20.

[26] "Either Type 5LP1 having medium-persistence green screen, or Type 5LP5 with short-persistence blue screen for film recording may be supplied." Allen B. Du Mont Laboratories Inc., *Du Mont Type 208 Cathode-Ray Oscillograph*, Product info sheet (after 1941), 4.
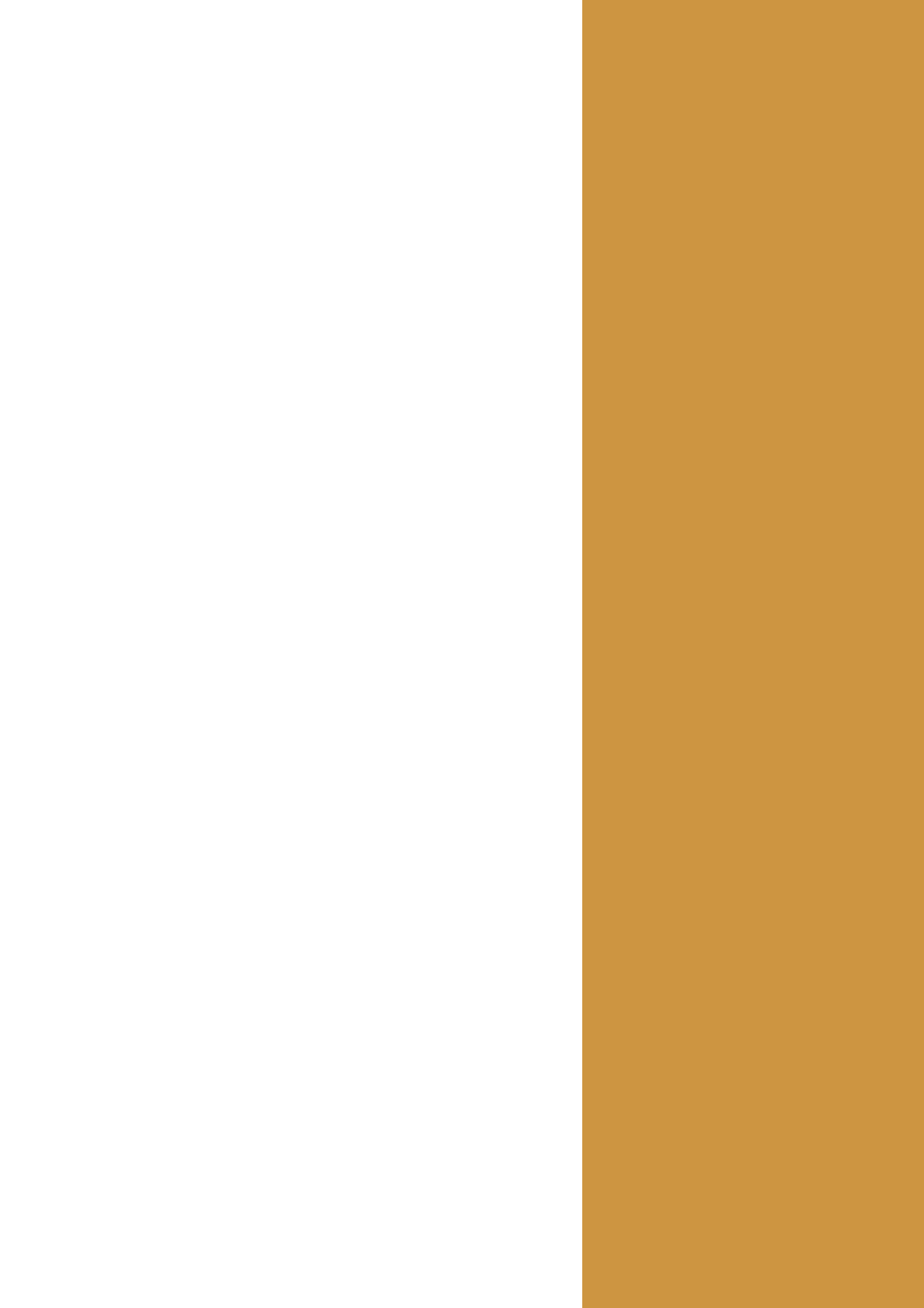
[27] McLaren and Beachell, "Stereographic Animation," 520 (emphasis added).

[28] McLaren and Beachell, "Stereographic Animation," 518.

[29] McLaren and Beachell, "Stereographic Animation," 520.

[30] McLaren and Beachell, "Stereographic Animation," 519.

[31] McLaren and Beachell, "Stereographic Animation," 518.

Food as an Art Material
Matters of Affordances and Material Images

Fabiana Senkpiel

Abstract

Starting from a discussion of artworks from the 1960s until today in which food has been used as material, this paper explores the possibilities and limitations of Gibson's concept of "affordances" for analyzing them from the viewpoint of an image-theory oriented art history. Three modes of using food as an art material are discussed, each highlighting different aspects of the affordance concept: in the first mode, the edibility affordance of food is maintained despite its change of context (everyday/art); the second mode primarily focuses on food's symbolic properties and shows the importance of the respective framework and contextual conditions for the non-actualization of the edibility affordance; in the third mode, organic properties in the sense of food's mutability, even to the point of decay, play an essential role in the challenge as to what edibility affordance actually is. Against this background, this article addresses the material dimension of the case studies discussed, with regard to the question of their image. In this context, it can be said of the first mode of food as an art material that it is a processual form of image in which the relationship between material and form is co-determined by the direct interaction of the public. In the second mode, the public does not directly intervene in the artwork: its image is rather determined by the viewer's own spatial relationship to it. The third mode is also about a processual image: the food, however, changes the relationship between form and material of the artwork by virtue of its own dynamics. It will become clear that the discussion of affordances depends not only on the basic conditions of the artistic context, but first and foremost on the definition of what constitutes the affordance of something.

The Dependence of Affordances on Framework Factors

The following remarks on artistic works using food as a material are based on the definitions of affordance(s) first outlined by the psychologist James J. Gibson in the context of his studies on perception. By drawing on the reception of his affordance concept in image-science oriented archaeology, the present essay intends to show the dependence of affordances on underlying factors in the artistic field. Aspects of natural and social affordance also play an important role here. Initially, Gibson outlines the concept of affordance as follows:

> Learning the Affordances of Objects: When the constant properties of constant objects are perceived (the shape, size, color, texture, composition, motion, animation, and position relative to other objects), the observer can go on to detect their *affordances*. I have coined this word as a substitute for *values*, a term which carries an old burden of philosophical meaning. I mean simply what things furnish, for good or ill. What they *afford* the observer, after all, depends on their properties. The simplest affordances, as food, for example, or as a predatory enemy, may well be detected without learning by the young of some animals, but in general learning is all-important for this kind of perception. The child learns what things are manipulable and how they can be manipulated, what things are hurtful, what things are edible, what things can be put together with other things or put inside other things—and so on without limit.[1]

A few years later, Gibson emphasized that we perceive *affordances* of objects and not their properties. He is thus interested in options for action that the environment offers.[2] Gibson's approach also had an impact on archaeology, where the concept of affordance commonly used is based on "[…] the possibilities of use given by the physical properties of an object," and was initially closely linked to the concept of functionality.[3] The fact that affordances are relational and relative was also underlined, as was the fact that they can change over time, since they depend on the respective context of their use and on the people who perceive them (or not).[4] It was furthermore stressed that affordances "[…] emerge dynamically in a subject's perceptual and motoric activity in the environment," and that affordances are related to presence and, of course, to sensory dimensions.[5]

In light of the definitions of affordance roughly outlined so far, this paper assumes that reviewing some case studies of food as an art material may put these concepts to the test. Where could affordance(s) serve as a fruitful approach to their analysis, and what are the limits of the concept's applicability? It should already be anticipated that the conceptual fuzziness and empirical imprecision of the affordance concept, which has already been established in the context of archaeological and praxeological/sociological analysis,[6] will also be demonstrated by means of the below case studies of artworks with food as their material.[7] For Gibson, food is an important example, and he repeatedly resorts to it in the development of his affordance concept.[8] Also in the abovementioned definition of the "affordance of objects," he inserts food as an example of one of the simplest affordances that can be recognized.[9] However, the situation regarding food is not that clear, as Gibson himself also indicates:

> Solid substances, being still more substantial, afford all sorts of physiological and behavioral activities. Certain of them afford eating, more exactly ingestion, and of those that afford ingestion some afford nutrition against others that do not. Some few in fact afford the opposite of nutrition, poisoning. (Note that I say nothing here about what affords pleasure in eating; that is another matter entirely).[10]

Especially when food is subjected to a change of context (or environment), namely from everyday life to art[11] and here exposed to possible interaction with the public,[12] the situation becomes even more challenging.

Modes of Using Food as An Art Material
Case Studies and the Question of Affordances

Foodstuffs are organic, living materials, and by their very nature they are particularly perishable. Since the 1960s at the latest, they have been increasingly used in artworks because of their shapeability and mutability as well as their sensual qualities and symbolic power.[13] Roughly three modes of using food as an art material can be distinguished that can be critically discussed in connection with affordances. In Gibson's logic, the affordance of food is of course its edibility, i.e.,

its eating potential and thus its function as nutrition for humans and animals. In the first mode envisaged of using food as a material in art, this affordance is maintained despite its change of context, from everyday life to the art world. The artistic works or parts of them may be eaten, so most of them are performative or installation artworks in which the audience participates and contributes significantly to the completion of the artwork's concept and meaning. Those artistic works with food as their material provide the public with a multisensory experience: in addition to the visual perception, the olfactory, haptic and gustatory perception can also be used. In these participation-based artistic works, the public can become active, even a co-producer of the artwork. The mode of impact of such artworks is thus significantly expanded: Through unleashing multiple senses, the reception possibilities for the participants unfold, and so their "[…] body becomes an epistemic organ."[14] Not least because of the physical, sensory and affective relationship with the human being that is thus encouraged, these artistic works using food can be linked to Actor-Network Theory (ANT).[15]

In the second envisaged mode of using food as an artistic material, the edibility affordance takes a subordinate role. These works of art do not provide for incorporation of the material used, instead, the cultural significance and symbolic power of the food used move to the center of the artistic work's generation of meaning. With regard to the first two modes of using food as an art material, the contexts in which such art takes place, is realized, perceived and, last but not least, negotiated, are formative for how it is handled or not, in Alan Costall's sense of natural and social affordances,[16] and in Gibson's sense of the possibilities of action by the actors involved.[17] As will be shown below, the ambiguity of affordances in particular crystallizes out in an analysis of this group of artistic works.[18]

In the third mode of using food as an art material, the primary affordance, i.e., the edibility of food, is challenged due to the material's own inherent dynamics: instead of the material's edibility, which gradually disappears, other properties of the material come to the fore, such as the organic change up to the point of decay, including characteristics such as the emergence of mostly unpleasant odors or mold growth, which can cause strong feelings of disgust in the public, and from which it has been learned over time that the material in this state is not suitable for consumption and may even be toxic. In connection with these processes of change caused by the material used, artistic works with food can even be linked with agency concepts[19] of materials and things. *New materialism* in particular is about the peculiar power of the material, or *material agency*, and examines the changeability and self-dynamics of each material.[20] In this third mode, instead of

edibility, the affordance emerges of the non-edibility of the decaying food that is applied as an artistic material. We thus here approach an aspect of the perceptual offer, based on the material used, *ex negativo*, as a learned behavior *not to do* something, which Gibson also mentioned in his first definition quoted above.

First Mode: Please Help Yourself and Eat the Artwork?

In this first mode of food as an art material, the property (edibility) and functionality (food carrier) of the material used are retained despite the change of context from everyday life to the art world. In 1976, the British performance artist Bobby Baker (born 1950) realized a sculptural installation consisting of a life-sized family made of edible cake that was entitled *An Edible Family in a Mobile Home*.[21] For this installation, Baker opened the house where she lived in Stepney in London to the public for one week. The family members each consisted of a different ingredient,[22] and each figure was assigned a room, the walls and interior of which (curtains, floors, ceilings, etc.) were papered with newspapers[23] whose article topics matched the person depicted. Baker also covered the furniture and all the decor with icing. Baker describes how she made the inner frames for the family figures and prepared and froze the cake in advance, before assembling the whole family three days before the opening. The visitors were invited to eat the work, and the artist was present during its gradual destruction.[24] Eating the work of art was initially encouraged by the artist, i.e., she defined and explained the framework of the action, and the audience was constantly engaged because they saw what could be done. The artist also made several remarks in interviews that are important with regard to the theme of affordance. When asked about the act of eating as "[…] a major structuring metaphor", she answered: "[…] I'd say I have a selective fascination with the particular purposes of eating. But I'm interested in this as part of a way of moving people into different structures beyond the normal ways of presenting food, setting food on the table and feeding people."[25] She continued: "With that specific piece [*An Edible Family in a Mobile Home*] I was thrilled at the prospect of the family disappearing; that the work would be lost and that it would be absorbed into other people's bodies. I am fascinated with the object becoming part of a body and then being shat out, the whole material cycle; so that you make a work of art which represents something and then it is physically transformed."[26] In connection with her further work *Drawing on a Mother's Experience*,[27] in which she draws with food and her body, she says: "[…] it was essential that the painting was made of food, because food is like my own language. Food has this wonderful endless way in which it can be used: the fact that it can be eaten or thrown on the floor—or I can eat it—or other people can eat it. It has such possibilities. So that

was the obvious thing to draw with […]."[28] Seen from an everyday perspective, the artist aims to go beyond the traditional act of eating, and also, reading between the lines, beyond woman's traditional role as housewife, mother and preparer of food[29] (which is in general a thematic focus of her art). She does this by decontextualizing edible everyday material and transferring it to the art world, where it in any case refers back to the context of its conventional use. Seen from an artistic perspective, Baker is interested in the possibility of the art object being eaten and thus fed into the cycle of material exploitation. Taking the case study *An Edible Family* as our starting point, we are dealing here with the retained functionality of the material (edibility), which is decontextualized and recontextualized, shifting it away from everyday life and into the art world.

The edibility of the art material that constitutes the artwork plays a role in the so-called *Candy spills*[30] by Felix Gonzalez-Torres (American, born in Cuba, 1957–1996).[31] Candy spills consist of accumulations of shiny packed candy: The essential aspect of this work is that it is adapted to the respective exhibition context: they can be piled up in rectangles, narrow strips, triangles, distributed freely about the room, or placed in a corner. Some of these artworks deals with the AIDS crisis of the 1980s and 1990s.[32] Thus, for example, *"Untitled" (Lover Boys)* from 1991[33] corresponds to the combined weight of the artist and his friend Ross Laycock, who died of AIDS.[34] It has been observed that these candy spills are in the tradition of giveaways, and that they invite the audience to touch and eat them.[35] However, this *invitation* is anything but explicit and unambiguous, because although it is part of the artist's concept of the work, it is not clearly defined *how* the *possibility* is to be communicated that the material may be taken for free and eaten in the respective installation. This is left to the museums and institutions, or rather their curators, and it also has decisive consequences on how the public behaves and actually encounters the artwork, as the theater scholar Sandra Umathum has observed.[36] This influences the possibility of eating the artwork or part of it, and is an essential aspect in terms of the ambiguity of affordances. Umathum speaks of the "Versatility of interpretation" ['Deutungsflexibilität'] in Felix Gonzalez-Torres's work,"[37] and both she and art historian Benedikt Fahrnschon connect Gonzalez-Torres's works to Umberto Eco's theory of the "open work of art" in which it is important to understand the work of art as an "[…] ambiguous message, as a majority of signifiers (meanings) contained in a single signifier (carrier of meaning)."[38] However, Umathum prefers to speak of spaces of possibility rather than spaces of action, because she emphasizes the spectrum of possibilities, the doing or omitting of the action called for: the public can make use of the work/of the sweets, or not (i.e., eat them or not), not least in awareness of their content

level: this signifies the tension between illness and mourning as well as between desire and sweetness that some of the *candy spills* stand for. More precisely, Umathum is concerned with the "emergence of performance situations that Gonzalez-Torres staged with his candy installations,"[39] and is mainly interested in the interpersonal relationships that Gonzalez-Torres's works evoke.

One leading, as-yet unsolved methodological challenge in relation to this first mode of using food as an art material is still how to capture the multisensory experience associated with the act of eating (apart from and beyond any neuroscientific analyses) in order instead to understand how it contributes to the artwork's generation of meaning.[40] In this context, the following question could be also of particular interest with reference to affordance: Would it therefore be possible to determine what reactions are provoked in different social, cultural and historical contexts by the artwork and the edibility affordance associated with the food materials used in it (the Americas/Africa/Asia/Europe)?

Second Mode: Please don't Touch, and don't Eat the Artwork

In the second mode of using food as an artistic material, food's cultural meaning and symbolic power move to the center of the artistic work's generation of meaning. The following art works use food as a linking aspect of cultural identity, and their artists operate subtly with a strategy of subversion through the use of the materials selected.

Kader Attia's *(Untitled) Ghardaïa* from 2009[41] consists of approximately 760 pounds of cooked couscous on a wooden table or floor, and digital prints on paper; the size is variable and depends on the exhibition location. The model of the city is framed by portraits of the Swiss-French architect Le Corbusier (1887–1965) and the French architect Fernand Pouillon (1912–1986), as well as a statement from the UNESCO advisory committee on the evaluation of the M'zab Valley as a World Heritage Site. This work thus points to the cultural exchange between France and Algeria that took place through the architects and the city that both inspired them and influenced Modernist European architecture. This moment of cultural exchange is intended to be a parallel to the life of the artist, who was born to Algerian parents in France in 1970. It has been noted that: "The use of couscous as a building material is symbolic, showing the impact of the artist's native culture

on that of France, Algeria's former colonizer. The work highlights the cultural impact of the colonized on the colonizer, reversing traditional thinking about the direction of influence."[42] Since the 13th century, couscous has been a basic foodstuff in North Africa. It originated with the Berber people, and has found its way into the cuisine of Europe and the wider world. In France, it has come third in surveys of people's favorite dishes.[43] Thus it stands as a symbol for cultural influences between East and West. In *(Untitled) Ghardaïa* it symbolizes cultural identity; however, at the same time, it is fragile as an artistic material and so a sign of a precarious state. Over the course of the installation, the couscous crumbles and disintegrates, only to be refreshed again when the structures of the city become unrecognizable, so that the forms of the city represented do not crumble. This can be read as an allusion to the faltering influence of the East on the West, posing the question as to whether Ghardaïa became important because of its local history, or because of its connection to Western architecture. The Laotian artist Vong Phaophanit (born 1961), trained in France and living in Great Britain, works using similar allusions to East and West in his 1993 work *Neon Rice Field*.[44] This floor-based installation consists of seven tons of dry, white, long-grain rice underlaid at intervals with six parallel tubes of red neon light. The dichotomy between East and West is shaken by the artist through a subtle act of subversion: in this work, the rice, which is the basis of existence in Asia and thus a symbol of the East,[45] comes from suppliers and sponsors in America. And the neon tubes, in turn, which are often associated with western cities, are just as characteristic of numerous cities in Southeast Asia. Thus, Phaophanit's ironic artistic strategy plays with the narratives inscribed in the materials selected and turns conventional assumptions on their head. He also wants the rice to emit its own odor into the adjoining rooms, thus interleaving an olfactory level with the visual one. In terms of affordance, these two examples, besides the *artistic* concept of non-edibility, can be used to highlight the context of the exhibition or the institution housing it, given that this determines the audience's actions in relation to the primary affordance (edibility) of the material used. We may assume that the audience is likely to uphold the habitual "museum behavior" that it has long learned, and thus will not touch the artwork. Gibson himself mentions learning as a condition for the perception of affordances in his early definition, as stated above.[46] Furthermore, this aspect can be followed by thoughts about *immediate* and *mediated* affordances. The archaeologist Carl Knappett takes the example of grass as a foodstuff that is edible for animals but not for humans, and emphasizes the natural and the learned affordances associated with it.[47]

Third Mode: Material Agency

The third mode of using food as an art material is characterized by the fact that the immediate edibility of food gradually disappears in the works of art in which it is used. Instead, other properties of the material come to the fore. One could speak here of a further type of affordance, such as the organic change of the material as it decays, which includes characteristics such as the emergence of mostly unpleasant odors and mold. As mentioned above, we could here describe affordance as a learned behavior *not to do* something: not to eat food that is about to expire, which can also cause feelings of disgust or physical reactions due to poisoning. On the one hand, artists can consciously use these organic and perishable characteristics conceptually, thus also accepting these changes and emphasizing the fragility and transience of their art and even the decay of the artwork. This means that the artists' conscious strategy is to explore the organic properties of the art material. On the other hand, artists can also work against this decay and, often in cooperation with conservators and other specialists, use scientific methods to intervene in the material to prevent or stop this process;[48] this, however, also changes the material's edibility.
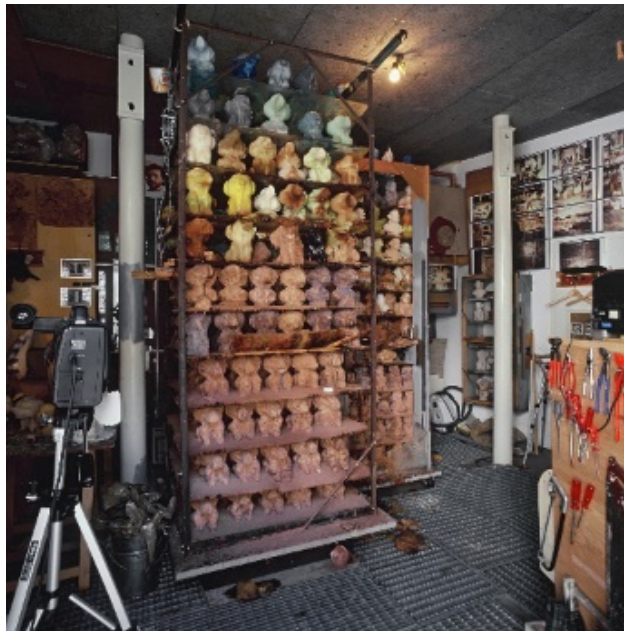
Dieter Roth, *Selbstturm*, 1969–1998, wood, glass, cast figures of chocolate and sugar, approx. 245 x 87 x 80 cm; *Löwenturm*, 1970–1998, iron, glass, cast figures of chocolate and sugar, approx. 260 x 100 x 100 cm. Studio room consisting of various materials, objects and equipment, Emanuel Hoffmann-Stiftung, deposit in Öffentliche Kunstsammlung Basel (Location St. Alban-Rheinweg/Basel) © Dieter Roth Estate, Courtesy Hauser & Wirth/© 2021 Laurenz-Stiftung, Schaulager Basel, Switzerland; Picture: Öffentliche Kunstsammlung Basel, Martin P. Bühler

The best-known example in this context is the artist Dieter Roth, who gave a new dimension to the use of food in artworks.[49] The installation/sculptural work *Selbstturm; Löwenturm* (1969–1998, Fig. 1) is a prime example of this.[50] It is part of Roth's studio, located opposite the main building of the Kunstmuseum Basel/Gegenwart in Switzerland. When visitors enter the small, dark room, their olfactory nerves perceive a penetrating smell. This emanates mainly from the two towers with self- and lion-portraits that are made of chocolate and sugar masses, stacked on top of each other on self-supporting racks and in a process of decay. The towers were built between 1969 and 1998. Apart from having the room fumigated twice, the materials in it have otherwise not been treated and have been in a process of decay for some fifty years, in keeping with the artist's intention. The course of this process of decay is difficult to assess, and presents conservators with considerable practical, methodological, substantive and ethical challenges.[51] A decay process is also the main motive in the video work *Still Life* (2001) by the artist Sam Taylor-Johnson (born 1967).[52] Here, the Baroque still lives live on. We see how a fruit bowl spoils over time, how its material composition and colors, how the surfaces of the fruit change, how the whole organic material loses volume, in short: how this peculiar form of liveliness unfolds. But there is more than this: what Baroque paintings only hinted at through symbols and motifs is realized before the eyes of contemporary viewers by this real fruit still life in decay that is captured in the medium of video. It makes the transitory immediately visible and visually experienceable (albeit in an accelerated, medium-conditioned temporality) and thereby expresses the essence of an entire genre in a nutshell.[53]

Selbstturm; Löwenturm and *Still life* challenge the concept of affordance by questioning the previously assumed edibility of food, thus asking whether this is the only possible affordance of food as a material. The so-called primary or natural affordance, i.e., the edibility of food, is here challenged due to the material's own inherent dynamics. Edibility does not play a role in these artworks because of the process of decay. In the case of Taylor-Johnson, this is also because of the medium chosen for its representation, namely video. The examples of Roth and Taylor-Johnson can be seen in the context of discourses concerning the material's own power of action, in which the material seems not to need any specific interaction with the audience for them to act. Here, agency is no longer exclusively attributed to people (in the sense of subjects with the capacity for consciousness and intentionality), but also to material objects and things. Accordingly, the art's materiality has also acquired a new quality: the materials used are seen as actors in artistic processes, and matter can be understood as an active principle.[54]

About the Material Image

It should be noted here that the case studies discussed in this article are equated with the "objects" and "artifacts" at the center of Gibson's affordance discourse and in image-science-oriented archaeology.[55] In other words, these case studies are understood as "artistic objects" (the emphasis is on the production of artifacts with aesthetic quality), whose image is decisively influenced by their material, but not only by it. In connection with the artworks presented thus far, the question of the image should be discussed in the light of their material characteristics *and* their aesthetic dimension.[56] Both aspects are often treated as separate, with the result that their art historical analysis remains incomplete.[57]

The relationship between form and material (which is processual) is decisive for the artworks' material image in the first mode of using food in art. The possibilities for interaction on the part of the audience play an important role here. The public is explicitly invited to help themself to the work, if they wish to do so.[58] The art concepts of Baker and Gonzalez-Torres provide for the gradual dissolution of the work in the course of its performative/installative exhibition, though there is a difference between them, as it will be explained below.

Baker said the following about the gradual destruction and ever-changing appearance of her work *An Edible Family*, and the multisensory experience to be gained from its material (namely cake):

> What I found slightly frustrating about it was that it was open for a week and very few people actually observed the transformation and that was such a crucial part of it. It was something I hadn't been able to work out would happen so effectively. It was a devastating image at the end. This family, they were completely destroyed, and it, you know, it actually smelt and the walls were… It was quite horrifying.[59]

It was pointed out that the artist identified this sculpted family with her own, and the little daughter with herself.[60] Nevertheless, one may wonder why the effect of this "destruction" and its "devastating image" was so "horrifying" to her, after all, the artist herself chose an edible material for her installation and offered the work to the public for consumption in a manner that was almost ostentatious (judging from her own description of it), and in which the primary functionality of the material she used was brought to bear. Baker's shocked state was perhaps due to the uniqueness and transience of her artwork in the sense that it only existed

during this short period of time. In the case of *An Edible Family*, the question of the material image is of primary importance since it is a unique, ephemeral work that is subject to the principle of processual pictoriality. It has not been "performed" again,[61] and only a few photographs of it survive. While an "ideal weight" or "original weight" characterizes the *candy spills* by Gonzalez-Torres,[62] their form can be fixed by the owner or the authorized borrower of the work. They can decide whether the sweets will be replenished and if so, to what extent. They can also decide not to replenish the pile and thus make it materially disappear altogether if the visitors take from the work in the course of the exhibition. Thus, there is the possibility that the work will decrease but it could also be reconstructed to its starting point, only to be immediately deconstructed again "[…] in order to maintain the continuous possibility of [its] disappearance," in the words of the art historian Sophie Junge.[63] In the case of Kader Attia's *(Untitled) Ghardaïa*, the couscous must be refreshed for the duration of the exhibition so that the form of the city remains constant, and thus the appearance of the work too. With Phaophanit's *Neon Rice Field*, one has to assume that the undulating rice fields were somehow treated to keep their shape.[64]

As far as the micro-level is concerned, *Selbstturm; Löwenturm*, possesses a specific image that is in a constant state of flux and is shaped by the dynamics of material changes of the sugar and chocolate masses, a material dynamic that is determined by decay and chance as well as material properties and textures. The expressive potential of this aesthetics of decay consists in the gradually new appearance of *Selbstturm; Löwenturm* and is also shaped and significantly reinforced by the factor smell. As far as the macro-level of the studio is concerned, this image depends in turn on the respective perspective of the visitor in the space and on the relationship of his or her body and field of vision to the artwork and the spatiality encompassing it, which will always be a fragmentary one.

The material image in situ of the aforementioned case studies is in general determined by where the observer is located or moves in relation to the work. This constitutes the image-field of the works, what Gibson terms the "visual field"[65] from the viewer's perspective, which depends on a certain spectrum of spatially determined possibilities for the relationship between the person and the work of art, the lighting conditions, etc. One important feature of the art works is not just that they are composed of food, but that the infrastructure of their installation offers a "frame" that determines one's multisensory perception, the aesthetic experience, and the entire art work's image. Thus here, too, the pictorial field of the work is constituted primarily by the spatial relationships between the artworks,

the space and viewers. In addition, the approach to the question of the material image must be dealt with from two levels that interact and complement each other: one cannot be thought of without the other, they stand in a dynamic figure-and ground-relationship.[66] One could be, so to speak, the micro-level of the installative-sculptural part and the other the macro-level of the space with all its components. Or, to put it another way: on the one hand, we are dealing with the specific image of what can be considered the work of art, and on the other hand, with the overall image of the exhibition venue. In addition to his affordance concept, Gibson writes the following on the subject of images:[67]

> The Original and Derived Meanings of the Term "Image": The meaning of image is a slippery one and no end of confusion has resulted. In this chapter the word always means an environmental source of optical stimulation, the cause of an optic array but not the array itself. An image can be a solid model, sculpture, or statue, on the one hand; or a flat relief, picture, painting, drawing, or photograph, on the other. […] The plastic image broadcasts its perspectives in all directions, while the graphic image yields a perspective only from in front. But both are delimited material objects producing an optic array of limited scope within the total array of ambient light. Even a so-called panoramic picture cannot present a view in all directions, a complete panorama of the environment including the hemispherical arrays from earth and sky.[68]

In Taylor-Johnson's *Still life*, there is no immediate multi-sensory experience from the decay of the foodstuff because the medium of video, which captures this process visually in a static, frontal view, is located between the artwork and the audience. The medium shines through, so to speak. We may thus affirm that the third mode of using food as an art material is also a processual pictoriality: the food, however, changes the relationship between form and material of the artwork by virtue of its own dynamics. Here, too, the organization of the exhibition in question and the chosen medium determine both their affordances and their pictoriality.

Conclusion

We must be cautious when drawing any conclusions about the possibilities and limits of the application of affordance concepts to the analysis of artistic works with food as their material. It also depends on how one defines affordance(s). If we reconsider Gibson's first definition of affordance, then the question arises as to *what* the principal or natural property or value is of an object or material, i.e., its affordance, and *who* determines it. In the case studies presented here, it is first of all the artists, the artistic contexts, institutional frameworks, and the material and aesthetic dimensions that determine the affordances or opportunities for perception, as well as possibilities for action by the public standing in front of the artwork. In our specific cases, a direct transmission of the edibility affordance of food is possible if an artistic work is focused on its sensual qualities, is participatory, and the food used is ready to eat. On the other hand, an artistic work that contains food as a material can focus on its symbolic power if it is "classically" sculptural or installational and as such is exhibited in a museum; here, it cannot directly fulfill the edibility criterion because both the concept behind the artwork and the conditions of the exhibition prohibit any direct, immediate interaction between the artwork and the public. Finally, there are artistic works using food that explore other properties of the material, such as its mutability instead of its edibility. Such art works with foodstuffs rely on the material's own agency and challenge not only edibility, but also the affordance concept as a whole.

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Notes

[1] James Jerome Gibson, *The Senses Considered as Perceptual Systems* (Boston/New York/Atlanta/Geneva/Ill./Dallas/Palo Alto: Houghton Mifflin Company, 1966), 285. Cf.: James Jerome Gibson, "The Theory of Affordances." In *Perceiving, Acting, and Knowing. Toward an Ecological Psychology*, ed. Robert Shaw, and John Bransford (Hillsdale, New Jersey: Lawrence Erlbaum, 1977) 67-82, here 67-68, where he writes that "the affordance of anything is a specific combination of the properties of its substance and its surfaces taken with reference to an animal."

[2] James Jerome Gibson, The *Ecological Approach to Visual Perception* (Boston/New York/Atlanta/Geneva/Ill./Dallas/Palo Alto: Houghton Mifflin Company, 1979), 134. In Gibson, "The Theory of Affordances," he also writes: "Different layouts afford different kinds of behavior and different sort of encounters […]", 68.

[3] Richard Fox, Diamantis Panagiotopoulos and Christina Tsouparopoulou, "Affordanz." In *Materiale Textkulturen. Konzepte – Materialien – Praktiken*, ed. Michael R. Ott, Rebecca Sauer, and Thomas Meier (Berlin/Boston: De Gruyter (Materiale Textkulturen, Vol. 1), 2015) 63-70, here 66-67; Carl Knappett, *Thinking Through Material Culture. An Interdisciplinary Perspective* (Philadelphia: University of Pennsylvania Press (Archaeology, Culture, and Society), 2005), 45–58, 111-112; Carl Knappett, *An Archaeology of Interaction. Networks Perspectives on Material Culture and Society* (Oxford: Oxford University Press, 2011), 7-8, 62-69.

[4] Fox, Panagiotopoulos and Tsouparopoulou, "Affordanz," 67; Knappett, *Thinking Through Material Culture*, 47-49; Knappett, *An Archaeology of Interaction,* 7-8, 62-69; James M. Skibo and Michael Brian Schiffer, *People and Things. A Behavioral Approach to Material Culture* (New York: Springer, 2009), 29.

[5] Paweł Grabarczyk and Marek Pokropski, "Perception of Affordances and Experience of Presence in Virtual Reality," *AVANT*, VII, no. 2 (2016), 25-44, quote 34.

[6] Fox, Panagiotopoulos and Tsouparopoulou, "Affordanz," 63-66; Robert Gugutzer, "Leibliche Interaktion mit Dingen, Sachen und Halbdingen. Zur Entgrenzung des Sozialen (nicht nur) im Sport." In *Die Sinnlichkeit des Sozialen. Wahrnehmung und materielle Kultur*, ed. Hanna Katharina Göbel and Sophia Prinz (Bielefeld: transcript Verlag (Sozialtheorie), 2015), 105-122; Knappett, *Thinking Through Material Culture*, 47-49.

[7] For an overview of the meaning of "material" with a focus on material as a carrier of physical properties, see Thomas Meier, Friedrich-Emanuel Focken, and Michael R. Ott, "Material." In *Materiale Textkulturen. Konzepte – Materialien – Praktiken*, ed. Michael R. Ott, Rebecca Sauer and Thomas Meier (Berlin/Boston: De Gruyter (Materiale Textkulturen, Vol. 1), 2015), 19-31; 21, the authors take up the concept of affordance and combine it with the use of things and their materiality.

[8] From the multitude of examples, I shall only mention here: Gibson, *The Senses Considered as Perceptual Systems*, 19, 53, 136-153 (Chapter "Tasting and Smelling as a Perceptual System").

[9] Gibson, *The Senses Considered as Perceptual Systems*, 285.

[10] Gibson, "The Theory of Affordances," 71.

[11] Monika Wagner and Dietmar Rübel, ed. *Material in Kunst und Alltag* (Berlin: Akademie Verlag (Hamburger Forschungen zur Kunstgeschichte. Studien, Theorien, Quellen, Vol. 1), 2002.

[12] On the influence of an exhibition's affordances on a visitor's eye, head and body movement behavior, analyzed through visitor studies, socio-cultural anthropology and mobile eye tracking (MET), see: Kira Eghbal-Azar, "Affordances, Appropriation and Experience in Museum Exhibitions: Visitors' (Eye) Movement Patterns and the Influence of Digital Guides" (PhD diss., Eberhard Karls Universität Tübingen, 2016). However, this approach is not pursued in this article.

[13] Isabella Augart and Ina Jessen, ed., *Metabolismen. Nahrungsmittel in der Kunst* (Hamburg: Hamburg University Press, 2019) deals with food both as a motif, i.e., as the subject of a painting, and as a concrete material in works of art; Germano Celant, ed., *Arts & Foods. Rituali dal 1851*, Milano, Italy (Triennale di Milano, April 9 – November 1, 2015; Expo Milano, March 1 – October 31, 2015) examines the relationship of different art genres – painting, design, photography, fashion, architecture, cinema, music, sculpture – to the manifold rituals of food or eating around the world; Ralf Beil, *Künstlerküche: Lebensmittel als Kunstmaterial – von Schiele bis Jason Rhoades* (Köln: DuMont, 2002) takes a material iconological approach in different chapters, each focusing on a different artist and considers the convergence of life and art through the increased use of perishable food as an artistic means of design since the avant-garde; Jürgen Raap, ed., "Essen und Trinken I." *Kunstforum International* 159 (April/May 2002) and Jürgen Raap, ed., "Essen und Trinken II." *Kunstforum International* 160 (June/July 2002), provide numerous cross-genre case studies of eating and food as a theme and object of art.

[14] Kunsthalle Düsseldorf, Galerie im Taxispalais Innsbruck and Kunstmuseum Stuttgart, ed., *Eating the Universe. Vom Essen in der Kunst*, Kunsthalle Düsseldorf, Düsseldorf, Germany (November 28, 2009 – February 28, 2010); Galerie im Taxispalais Innsbruck, Innsbruck, Austria (April 24 – July 4, 2010); Kunstmuseum Stuttgart, Stuttgart, Germany (September 17, 2010 – January 9, 2011) 6-7, 15-16.

[15] Bruno Latour, *Pandora's Hope. An Essay of the Reality of Science Studies* (Cambridge (Mass.): Harvard University Press, 1999); Bruno Latour, *Reassembling the Social. An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005); John Law, "After ANT: Complexity, Naming and Topology." In *Actor Network Theory and After*, ed. John Law and John Hassard (Oxford: Blackwell, 1999), 1-14. On the indirect or secondary agency of artworks from an anthropological perspective cf. Alfred Gell, *Art and agency. An Anthropological Theory* (Oxford: Clarendon Press, 1998); Alfred Gell, "The Technology of Enchantment and the Enchantment of Technology." In *Anthropology, Art and Aesthetics*, ed. Jeremy Coote and Anthony Shelton (Oxford: Clarendon Press (Oxford studies in the anthropology of cultural forms), 1992), 40-66, here 43, 52.

[16] Alan Costall, "Socialising Affordances," *Theory & Psychology* 5 (1995), 467-481; Alan Costall and Ann Richards, "Canonical Affordances: The Psychology of Everyday Things." In *The Oxford Handbook of the Archaeology of the Contemporary World*, ed. Paul Graves-Brown, Harrison Rodney, and Angela Piccini (Oxford: Oxford University Press, 2013), 82-93.

[17] Gibson, *The Ecological Approach to Visual Perception*, 134.

[18] Gibson, *The Senses Considered as Perceptual Systems*, 23, 248-249, 309.

[19] On theories and forms of agency, especially from a philosophical perspective but also in other disciplines, see: Markus Schlosser, "Agency." In *The Stanford Encyclopedia of Philosophy* (Winter 2019 Edition), ed. Edward N. Zalta, Access Date: November 24, 2020. https://plato.stanford.edu/cgi-bin/encyclopedia/archinfo.cgi?entry=agency.

[20] Horst Bredekamp and Wolfgang Schäffner, "Material Agencies," *Zeitschrift für Kunstgeschichte* 83/3 (2020), 300-309; Christiane Heibach and Carsten Rhode, "Material turn?" In *Ästhetik der Materialität*, ed. Christiane Heibach and Carsten Rhode (Paderborn: Wilhelm Fink Verlag, 2015 (HfG Forschung, Vol. 6), 9-30; Tony Bennett and Patrick Joyce, ed. *Material powers. Cultural studies, history and the material turn* (London: Routledge, 2010); Sarah Ellenzweig and John H. Zammito, ed., *The new politics of materialism. History, philosophy, science* (London/New York: Routledge, 2017); Nick J. Fox and Pam Alldred, ed., *Sociology and the New Materialism. Theory, Research, Action* (Los Angeles: Sage, 2017); Susanne Witzgall and Kerstin Stakemeier, ed., *Macht des Materials/Politik der Materialität* (Zurich: diaphanes, 2014); Diana H. Coole and Samantha Frost, ed., *New materialisms. Ontology, agency, and politics* (Durham NC: Duke University Press, 2010); Carl Knappett and Lambros Malafouris,

"Material and Nonhuman Agency: An Introduction." In *Material Agency. Towards a Non-Anthropocentric Approach*, ed. Carl Knappett and Lambros Malafouris (New York: Springer, 2008), ix-xix; Jane Bennett, *The Enchantment of Modern Life. Attachments, Crossings, and Ethics* (Princeton NJ: Princeton University Press, 2001).

[21] Bobby, Baker, "Daily Life Ltd. An Edible Family in a Mobile Home," access Date: January 31, 201. https://www.dailylifeltd.co.uk/projects/an-edible-family-in-a-mobile-home-; Christiane Czymoch, *(Alp)Traumfrauen – Performative Reflexion von Gender in der britischen Live Art. Subversives Potential bei Kira O'Reilly, Bobby Baker und Oreet Ashery* (Marburg: Tectum Verlag (Kleine Mainzer Schriften zur Theaterwissenschaft, Vol. 25), 2014), 16-19, 164, and on other performances: 30-39, 46-49, 74-80, 90-99, 117-135, 163-166, 203-204.

[22] Lucy Baldwyn, "The Immaterial Art of Bobby Baker's Culinary Events," *TDR* 40, no. 4 (Winter 1996), 37-55, here 38-40.

[23] On food as art material in connection with the use of newspapers as media criticism, Cf.: Fabiana Senkpiel, "Einverleibungen – Interpikturale Bezugnahmen und intermediale Verfahren durch Lebensmittel in der Gegenwartskunst." In *Metabolismen. Nahrungsmittel in der Kunst*, ed. Isabella Augart and Ina Jessen (Hamburg: Hamburg University Press, 2019), 27-39, Access Date: December 15, 2020, https://hup.sub.uni-hamburg.de/volltexte/2020/202/chapter/HamburgUP_Metabolismen_03_Senkpiel.pdf.

[24] Baker, Bobby, "Daily Life Ltd. An Edible Family in a Mobile Home." Access Date: January 31, 2021, https://www.dailylifeltd.co.uk/projects/an-edible-family-in-a-mobile-home-.

[25] Adrian Heathfield, "Risk in Intimacy. An interview with Bobby Baker," *Performance Research. A Journal of the Performing Arts* 4, no. 1 (1999), 97-106, here 98.

[26] Heathfield, "Risk in Intimacy," 98.

[27] Czymoch, *(Alp)Traumfrauen*, 19, 74-80, 121-135, 203-204.

[28] David Tushingham, *Food for the Soul. A New Generation of British Theatremakers*. [Interviews by David Tushingham; Photographs by Simon Annand] (London: Methuen Drama (Live. A polemic review of the performing arts, Vol. 1), 1994), 30.

[29] Czymoch, *(Alp)Traumfrauen*, 74-80, 203-204.

[30] "Candy Works", The Felix Gonzalez-Torres Foundation, Access Date: February 06, 2021, https://www.felixgonzalez-torresfoundation.org/works/c/candy-works; Dietmar Elger, ed., *Felix Gonzalez-Torres. Catalogue raisonné*, Sprengel Museum Hannover, Hannover, Germany (June 1 – August 24, 1997); Kunstverein St. Gallen/Kunstmuseum, St. Gallen, Switzerland (September 6 – November 16, 1997); Museum Moderner Kunst Stiftung Ludwig Wien, Wien, Austria (Fall 1998). Ostfildern-Ruit: Hatje Cantz Verlag, 1997), 9, 52 (no. 86), 57 (no. 99), 61 (no. 106), 65 (no. 109), 67 (no. 113), 68 (no. 116), 70 (no. 112), 72 (no. 126), 77 (no. 137), 79 (no. 140), 87 (no. 161), 89 (no. 167), 90 (no. 168), 94 (no. 178, 179), 100 (no. 189), 107 (no. 204) 127 (no. 251).

[31] Julie Ault, Julie, ed., *Felix Gonzalez-Torres* (Göttingen: Steidl Publishers, [2]2016).

[32] Sophie Junge, "'Kunst essen'. Aspekte der Einverleibung und Intensivierung bei Felix Gonzalez-Torres," *kunsttexte* 3 (2009), 6 pp.; Benedikt Fahrnschon, "Ein stetiger Wandel. Auflösung und Erneuerung als zentrale Aspekte im Werk von Felix Gonzalez-Torres." In *BilderGewalt*, ed. Birgit Ulrike Münch, Andreas Tacke, Markwart Herzog, and Sylvia Heudecker (Petersberg: Michael Imhof Verlag, 2018), 140–153, here 145.

[33] The Felix Gonzalez-Torres Foundation, Felix Gonzalez-Torres, *"Untitled" (Lover Boys)*, 1991, access date February 06, 2021, https://www.felixgonzalez-torresfoundation.org/works/untitled-lover-boys.

[34] Fahrnschon, "Ein stetiger Wandel," 147–150.

[35] Junge, "'Kunst essen'", 1; Joachim Penzel, "Giveaway." In *Begriffslexikon zur zeitgenössischen Kunst*, ed. Hubertus Butin (Köln: Snoeck, 2014), 103–106.

[36] Sandra Umathum, "An dem Ort, von wo man schaut: Felix Gonzalez-Torres' Candy Spills." In *Kunst als Aufführungserfahrung. Zum Diskurs intersubjektiver Situationen in*

der zeitgenössischen Ausstellungskunst. Felix Gonzalez-Torres, Erwin Wurm und Tino Sehgal, ed. Sandra Umathum (Berlin: De Gruyter, 2011), 27-71, cf. especially the chapter "Tun oder Unterlassen?," 51-60.

[37] Umathum, "An dem Ort, von wo man schaut," 32-43.

[38] Umathum, "An dem Ort, von wo man schaut," 42; Fahrnschon, "Ein stetiger Wandel," 143.

[39] Umathum, "An dem Ort, von wo man schaut," 60, 70.

[40] In order to obtain precise and differentiated answers to these questions, one would have to conduct a kind of field study in which the reactions of the public are recorded, or the public is questioned about them and their answers documented. Bruna Casagrande, a conservator/restorer of new materials and media is currently developing a conservation documentation method with a focus on multisensoriality, based on reports from the public, especially experts from disciplines relevant to the artwork in question, as part of the research project "Food as a Material in Installative and Participative-Performative Artistic Works – Documentation, Analysis, Reception," funded by the Swiss National Science Foundation. For a preliminary study on the topic, see Bruna Casagrande, "A Report from the Audience. The Multi-perspective Witness Report as Method of Documenting Performance Art," VDR-Beiträge zur Erhaltung von Kunst- und Kulturgut, no. 2 (2017), 95-99. On the research project, see: "Lebensmittel als Material in installativen und partizipativ-performativen künstlerischen Arbeiten – Dokumentation, Analyse, Rezeption." SNSF-Research-Project at Institute for Practices and Theories in the Arts at Bern University of the Arts, 2018–2022, Fabiana Senkpiel, Access Date: November 24, 2020. http://p3.snf.ch/project-182143 and https://www.hkb.bfh.ch/de/forschung/forschungsprojekte/2019-795-679-052/. Regarding further discourses around the documentation of performative artistic works, see: Julia Reich, "Die Rolle der Augenzeugenschaft in Tino Sehgals Praxis. Eine alternative dokumentarische Strategie?" In Augenzeugenschaft als Konzept. Konstruktionen von Wirklichkeit in Kunst und visueller Kultur seit 1800, ed. Claudia Hattendorff, and Lisa Beißwanger (Bielefeld: transcript Verlag, 2019), 177-192, DOI: 10.14361/9783839446089-012; Julia Reich, "Was bleibt, wenn nichts bleibt? Zur (gegen)dokumentarischen Praxis bei Tino Sehgal." In Gegen\\Dokumentation. Operationen – Foren – Interventionen, ed. Esra Canpalat, Maren Haffke, Sarah Horn, Felix Hüttemann, and Matthias Preuss (Bielefeld: transcript Verlag, 2020), 63-76, DOI: 10.14361/9783839451670-004; Annet Dekker, Gabriella Giannachi, and Vivian van Saaze, "Expanding Documentation, and Making the Most of 'the Cracks in the Wall'." In Documenting Performance. The Context and Processes of Digital Curation and Archiving, ed. Toni Saint (London: Bloomsbury (Methuen Drama), 2017), 61-78; Toni Sant, ed., Documenting Performance. The Context and Processes of Digital Curation and Archiving (London/Oxford/New York/New Delhi/Sydney: Bloomsbury (Methuen Drama), 2017); Gabriella Giannachi, Nick Kaye, and Michael Shanks, ed., Archaeologies of Presence. Art, Performance and the Persistence of Being (London/New York: Routledge, 2012); Barbara Clausen, and Museum Moderner Kunst Stiftung Ludwig Wien, ed., After the Act. Die (Re)Präsentation der Performancekunst, Museum Moderner Kunst Stiftung Ludwig Wien, Wien, Austria (November 4 – December 4, 2005).

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[42] Sharon Vatsky, "Identity: Three Global Perspectives," *Art Education* 69, no. 6, (2016), 50-56.

[43] Vatsky, "Identity," 56.

[44] Vong Phaophanit and Claire Oboussier, "Neon Rice Field. Vong Phaophanit," Access Date: November 13, 2020. https://atopia.org.uk/commission/neon-rice-field/. For more about this artist, who works primarily in the fields of sculpture and installation, and on his work, see: Andrew Cross, "Phaophanit, Vong," *Oxford Art Online*, Access Date: October 22, 2020. https://doi.org/10.1093/gao/9781884446054.article.T096925; Claire Lieberman, "That Food Thing You Do," *Sculpture* 19, no. 10 (December 2000), 46-53; Ratnam Niru, "Exhibitions: Reviews: Vong Phaophanit," *Art Monthly* 216 (May 1998), 32-34; Catherine Marshall, ed., *Breaking the Mould. British art of the 1980s and 1990s: The Weltkunst Collection* (London: Lund Humphries Publishers, 1997), 96, illustration 37.

[45] Lieberman, "That Food Thing You Do," 49.

[46] Gibson, *The Senses Considered as Perceptual Systems*, 285; see also Gibson, *The Senses Considered as Perceptual Systems*, 147.

[47] Knappett, *Thinking Through Material Culture*, 50.

[48] Christian M. Scheidemann, "Do not Eat Art – Konservierung von Lebensmitteln in der zeitgenössischen Kunst," *Nike Bulletin* 3 (2001), 17-20; Judith Welter, "Leben als Mittel zur Kunst? Über das (Auf)Bewahren von Lebensmitteln im Museum." In *LebensMittel. Essen und Trinken in den Künsten und Kulturen*, ed. Ottmar Ette, Yvette Sánchez, and Veronika Sellier (Zurich: Diaphanes, 2013), 207-220; Ann Comiotto, Marc Egger, Caroline Forster, Agathe Jarczyk, Isabelle Krieg, George Steinmann, Markus Vahinger, and Karin Wyss, "Developing Durable Foodstuffs for Contemporary Art." In *Postprints of the International Conference FUTURE TALKS 011: Technology and Conservation of Modern Materials in Design* (Munich: Die Neue Sammlung, 2011), 168-175.

[49] Beil, *Künstlerküche: Lebensmittel als Kunstmaterial*, 164–209.

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[51] Peter Berkes, "Die Kunst und die Würmer: Dieter Roths verderbliche Werke," *Nike Bulletin* 3 (1997), 8-11.

[52] Sam Taylor-Johnson, "Still life, 2001,", video, 03:35, Access Date: November 24, 2020, https://samtaylorjohnson.com/; Cf.: Victoria von Flemming, "Stillleben intermedial: Eine Deutungsstrategie des Barocken von Sam Taylor Wood." In *Barock – Moderne – Postmoderne: ungeklärte Beziehungen*, ed. Victoria von Flemmin, and Alma-Elisa Kittner (Wiesbaden: Harrassowitz Verlag (Wolfenbüttler Arbeiten zur Barockforschung, Vol. 50), 2014), 289-313.

[53] von Flemming, "Stillleben intermedial."

[54] Bredekamp and Schäffner, "Material Agencies," 300-309; Heibach and Rhode, "material turn?" 9-30; Bennett, and Joyce, *Material powers*; Ellenzweig, and Zammito, *The new politics of materialism*; Fox and Alldred, *Sociology and the New Materialism*; Witzgall and Stakemeier, *Macht des Materials/Politik der Materialität*; Coole and Frost, *New materialisms*; Knappett and Malafouris, "Material and Nonhuman Agency: An

Introduction," ix-xix; Bennett, *The Enchantment of Modern Life*; on the indirect or secondary agency of artworks from an anthropological perspective, cf. Gell, *Art and agency*; Gell, "The Technology of Enchantment and the Enchantment of Technology," 40-66; Latour, *Pandora's Hope*; Latour, *Reassembling the Social*; Law, "After ANT: Complexity, Naming and Topology," 1-14.

55 On the "artifact," see Christina Tsouparopoulou and Thomas Meier. "Artefakt." In *Materiale Textkulturen. Konzepte – Materialien – Praktiken*, ed. Michael R. Ott, Rebecca Sauer, and Thomas Meier (Berlin/Boston: De Gruyter (Materiale Textkulturen, Vol. 1), 2015), 47-61; see *id.* 53 on the "object": they note, however, that "Objekt" and "Gegenstand" are marked by the Cartesian dualism of mind and matter, among other things, and thus their use in a praxeologically oriented context makes little sense. On objects and things, artifacts and art objects/artworks, as well as images from the perspective of material culture, see Carl Knappett, "The Neglected Networks of Material Agency: Artefacts, Pictures and Texts." In *Material Agency. Towards a Non-Anthropocentric Approach*, ed. Carl Knappett and Lambros Malafouris (New York: Springer, 2008), 139-156, here 143-146; Knappett, *Thinking Through Material Culture*, 122-128; Costall, "Socialising Affordances"; Costall and Richards, "Canonical Affordances"; Dietmar Rübel, "Dinge werden Kunst – Dinge machen Kunst. Über das Verhalten eigensinniger Objekte." In *Die Tücke des Objekts. Vom Umgang mit Dingen*, ed. Katharina Ferus and Dietmar Rübel (Berlin: Reimer Verlag (Schriftenreihe der Isa Lohmann-Siems Stiftung, Vol. 2), 2009), 128-155.

56 Fundamental to aesthetic issues from a philosophical perspective: Juliane Rebentisch, *Aesthetics of Installation Art* (Berlin: Sternberg Press, 2012).

57 For this critique in the field of art history, see: Petra Lange-Berndt, "Introduction. How to Be Complicit with Materials." In *Materiality. Documents of Contemporary Art*, ed. Petra Lange-Berndt (London: Whitechapel, 2015), 12-23, here 23-24; in the field of material culture studies: Angeliki Karagianni, Jürgen Paul Schwindt, and Christina Tsouparopoulou, "Materialität." In *Materiale Textkulturen. Konzepte – Materialien – Praktiken*, ed. Michael R. Ott, Rebecca Sauer, and Thomas Meier (Berlin/Boston: De Gruyter (Materiale Textkulturen, Vol. 1), 2015), 33-46, here 38. For an overview of the relationship between material and form see also Meier, Focken, and Ott, "Material"; and in the field of material culture studies: Karagianni, Angeliki, Jürgen Paul Schwindt, and Christina Tsouparopoulou. "Materialität." In *Materiale Textkulturen. Konzepte – Materialien – Praktiken*, ed. Michael R. Ott, Rebecca Sauer, and Thomas Meier, 33-46. Berlin/Boston: De Gruyter (Materiale Textkulturen, Vol. 1), 2015.

58 Umathum, "An dem Ort, von wo man schaut," 51-60; Fahrnschon, "Ein stetiger Wandel," 149.

59 Tushingham, *Food for the* soul, 29.

60 Tushingham, *Food for the* soul, 29; Helen Iball, "Melting Moments: Bodies Upstaged by the Foodie Gaze," *Performance Research. A Journal of the Performing Arts* 4, no. 1 (1999), 70-81, here 73-74.

61 In Tushingham, *Food for the soul*, 33-34, the artist announced the resumption of her artistic work at the Museum of Contemporary Art in Sydney, but I have not yet found any further information about this.

62 "Candy Works", The Felix Gonzalez-Torres Foundation, Access Date: February 06, 2021, https://www.felixgonzalez-torresfoundation.org/works/c/candy-works.

63 Umathum, "An dem Ort, von wo man schaut," 43-50; Junge, "'Kunst essen'," 2; Fahrnschon, "Ein stetiger Wandel," 146-147; Robert Hobbs, "Felix Gonzalez-Torres' Epistemic Art," *Cornell Journal of Law and Public Policy* 26, no. 3 (2017), 483-495, here 487.

64 I have not found any corresponding information in the literature, however.
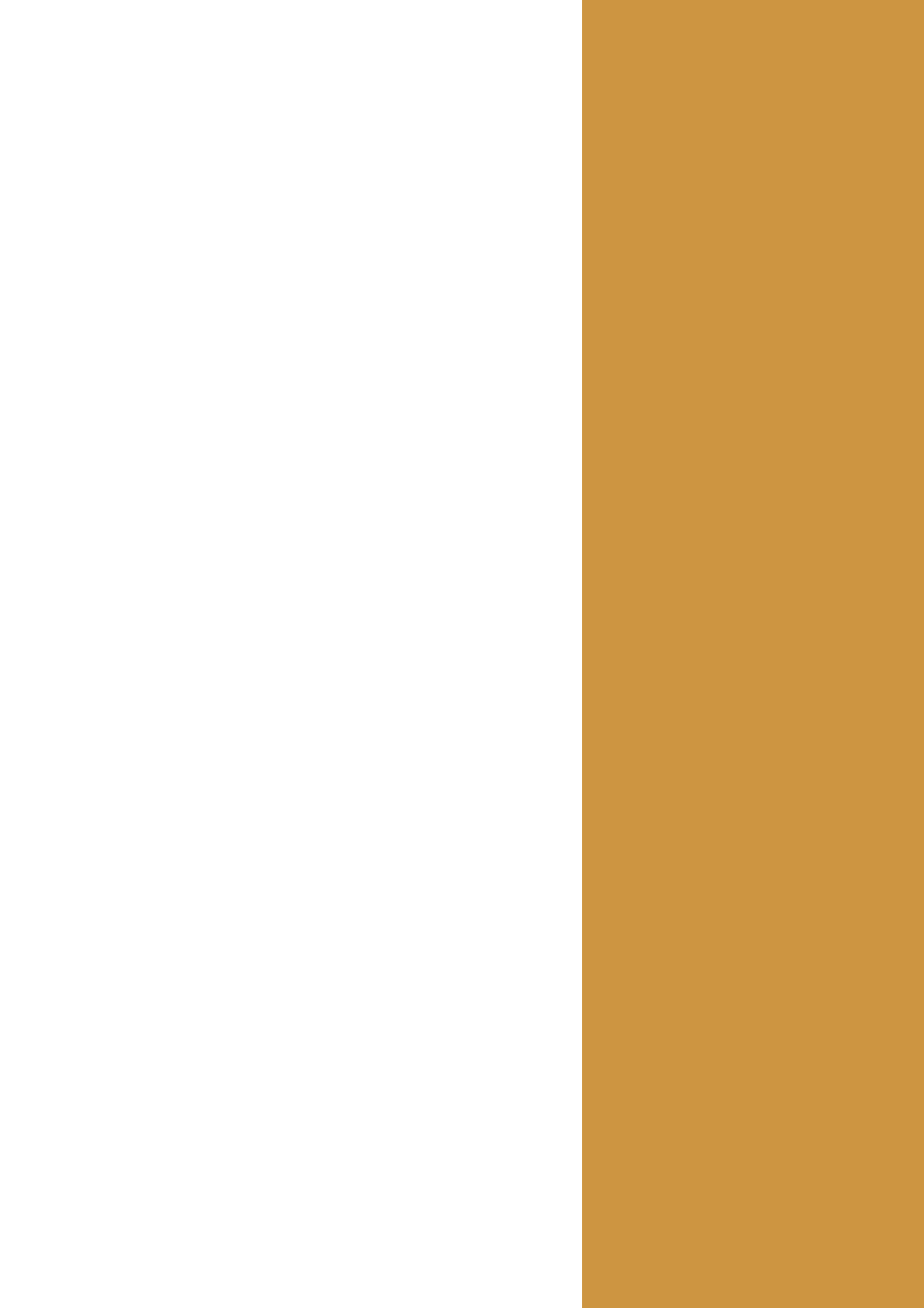
65 Gibson, *The Senses Considered as Perceptual Systems*, 237.

66 Gottfried Boehm, "Der Grund. Über das ikonische Kontinuum." In *Der Grund. Das Feld des Sichtbaren* ed. Id., and Matteo Burioni (München/Padernborn: Wilhelm Fink

Verlag 2012), 29-93; Gottfried Boehm, "Form und Zeit. Relationen zwischen Bild und Performance." In *Performing the Future. Die Zukunft der Performativitätsforschung* ed. Erika Fischer-Lichte, and Kristiane Hasselmann, (München/Paderborn: Wilhelm Fink Verlag 2013), 241-252.

[67] For Gibson's image concept, see: Gibson, *The Senses Considered as Perceptual Systems*, 225-238, here 231, where he also writes: "[…] A complete history of representation had not yet been written. The methods are extremely various, and it is hard to separate technology from art, and art from psychology (Gombrich 1960; Arnheim 1954). In the welter of confusion, it will not be easy to establish a science of pictures comparable to the science of linguistics."

[68] Gibson, *The Senses Considered as Perceptual Systems*, 225-226; further on, he writes: "Sculptures, paintings, and the intermediate case of reliefs were the only kinds of images known during prehistory and a good part of recorded history. But men eventually became curious about mirrors and lenses, and the developing science of optics inevitably borrowed the term image and used it to describe results of operations on light rays. Most of the so-called images of instrumental optics, however, are fictions, not things. An optical instrument such a microscope or telescope is an adjunct to an eye, and all it can do is deliver a magnified optic array to an eye. We should not confuse the "images" seen through eyepieces or in mirrors with paintings or sculptures, although we tend to do so."

Between the Extraordinary and the Everyday
How Instagram's Digital Infrastructure
Affords the (Re)contextualization of
Art-Related Photographs

Sarah Ullrich and Katharina Geis

Abstract

Digital technology and practices of photographic self-representation, captioning, tagging and sharing on social media have effectively transformed the museum experience by blurring the lines between museum visits and everyday life. The many visitors today who take photographs while at art collections or other exhibits and then upload them onto Instagram render the exclusive experience of museums a part of ordinary medialized space. In understanding *affordances* in relation to how people interact with material environments, technology and media, we examine routinized actions and their entanglement with incorporated knowledge, stressing the importance of their social dimensions. Based on empirical data gathered in an ongoing ethnographic research project, we analyze the affordances of Instagram and how they are enacted by users. For this article, we investigate in detail how the platform's infrastructures are appropriated by users in order to address current events and express personal opinions with the help of seemingly unrelated visual content. We argue that the habit of using Instagram for everyday communication is what allows individuals to attach alternative meanings to digital images from museums and art galleries. In the discussion, we consider the economies of valuation and attention within the context of socially distributed practices along with the temporal structures of social media and their impact on visual sense-making. Finally, we ask whether the afforded practices of recontextualization have contributed to a shift in authority away from museums and other influential institutions in the artworld.

Introduction

Enter any museum in the world and you are likely to see visitors using their smartphones to take photos of artworks and themselves. Often, the images produced in museums remain private. But increasing numbers of them are also appearing on social media platforms. The online posts not only utilize the visual qualities of the photographs; they also make use of comments and captions, hashtags and hyperlinks. They are, for all intents and purposes, *curated*.

The practices of posting on social media, together with their embeddedness in media structures, are the focus of the DFG-funded research project *Curating Digital Images: Ethnographic Perspectives on the Affordances of Digital Images in Heritage and Museum Contexts*,[1] based at the Humboldt University's Centre for Anthropological Research on Museums and Heritage (CARMAH), and part of the DFG priority program 'Das digitale Bild'/'The Digital Image'. The project draws on affordance theory to explore how digital images enable practices of digital curation. Two interconnected areas of work examine the ways that digital images transform museum experiences and shape everyday life. The first looks at how and to what ends users of online museum collection archives search, sort, alter and creatively rearrange digital images in non-museum related spaces. The second is interested in how museum and heritage visitors take photos in physical museums and how they curate them on social media platforms. Both areas of work seek to gather empirical data from online and offline environments.

The first few months of exploratory fieldwork have already yielded up an array of practices and affordances within the two areas of work. One interesting finding is that the visual content from visitors' museum experiences has become a medium to discuss and work through everyday concerns. For many people today, social media use is an integral part of everyday life and an important vehicle for moving the extraordinary into the ordinary. For example, we observed the way individuals recontextualize digital images from museums to comment on political issues such as cultural appropriation, Black Lives Matter and the precarious political situation in the US that are not directly tied to the material quality of the depicted artefacts or environments.

The following article looks at this finding more closely. In this paper we will discuss one case study that represents a number of similar findings. The chosen case study illustrates Instagram users' practices of incorporating current topics into their social media usage particularly well. How does Instagram's digital infrastructure facilitate the social negotiation of current events by means of sharing and uploading visual content from museums? How do social media platforms and images support practices of recontextualization in the public sphere? And how do users generate relations between digital images and current events? Below we examine these questions from an ethnographic perspective inflected by the notion of affordance.

Relational affordances

In the 1960s James J. Gibson coined the term *affordance* to describe the range of possible activities and actions that an environment offers individuals based on its material qualities.[2] Since then, scholars from different disciplines have expanded on the term's meaning in various directions, producing a multiplicity of affordance theories. Each approach emphasizes different aspects.[3] Of particular interest for us are theories that emphasize the importance of the social dimension. In this article as well as in our research for the Curating Digital Images project, we take an ethnographic perspective that builds on previous work in the area of museum and heritage studies (Macdonald 2009, 2013; Bareither 2019a) and digital media studies (Hopkins 2016; Hutchby 2001; Costa 2018). Ours is particularly indebted to Christoph Bareither's approach (2019a, 2019b, 2020), which enlists the idea of affordance to think about the relationships between visitors, digital media, museums and heritage spaces, including their aesthetic and emotional dimensions. This approach focuses on the relationship between people, material environments, objects, technology and media in which routine actions and patterns are entangled with incorporated knowledge and practical sense.[4] The groundwork for this relational understanding was laid by Tim Ingold in 1992, when he began to consider how humans perceive affordances and how culture plays into their perceptions.[5] For Ingold, people do not perceive something first and then act on it. Each is intertwined with the other: "I believe that our immediate perception of the environment is in terms of what it affords for the pursuit of the action in which we are currently engaged."[6] Affordances provide possibilities for actions without thereby determining them. They emerge not only from the physical environment but from anything that people encounter in their experience with the world around them. Indeed, experience itself plays an important role in what people perceive as affordances in the first place. As Webb Keane argues, "People usually respond not to immediate percepts in isolation but to recognizable patterns over time."[7]

When applied to our case of museum spaces and social media the relational character of social situations, culture and technology generate implicit knowledge about the field. One part of that knowledge is that change is ubiquitous and inevitable, which accords with Ingold's view that "no environment is ever fully created, it is always undergoing creation. It is 'work in progress.'"[8] This process changes constantly with people and their environment because each "implicates" the other.[9] Individuals on social media platforms learn to utilize interfaces and social mechanisms to meet their personal needs. "The information that is potentially available to an agent is inexhaustible,"[10] Ingold wrote way back in 2000:

> [O]ne learns to perceive in the manner appropriate to a culture, not by acquiring programmes or conceptual schemata for organizing sensory data into higher-order representations, but by 'hands-on' training in everyday tasks whose successful fulfilment requires a practiced ability to notice and to respond fluently to salient aspects of the environment. In short, learning is not a transmission of information but – in Gibson's (1979: 254) words – an 'education of attention'. As such, it is inseparable from a person's life in the world…[11]

This becomes particularly apparent when we pay regard to the affordances of museum spaces themselves and examine how the use of digital devices shapes and alters them. Cultural anthropological visitor studies acknowledge that the way in which museum spaces are curated and arranged guide visitors' attention. Therefore, certain objects are more likely to be noticed by visitors than others.[12] The arrangement of physical museum spaces affords a variety of practices like looking at a certain object, photographing it from different angles or getting drawn in to a hands-on station that suggests touching and interacting.[13] In 1997, Beverly Serrell stated that the majority of visitors show highly selective patterns of attention, stopping only at some exhibits and closely inspecting even fewer of those.[14] Taking these findings into account reveals that the design of physical spaces affords specific patterns of movement and perception. Our ethnographic perspective considers these modes of engagement as entangled with and based on the visitors' incorporated knowledge and practical sense.

However, the museums' physical characteristics do not necessarily afford re-contextualizing the exhibited objects on social media platforms or providing the artworks on display with alternative meaning. Rather, the technological devices that visitors bring into the physical space prompt users to draw connections between exhibition contents for their everyday life and personal interests. As will become apparent in the investigation of our case study, media use can enhance and change the way in which visitors interact with the museums' materialities. The connection between the physical (museum) space and media technologies is essential to our research project and must therefore be looked at in more detail in future analyses of our empirical material. In this article, we will specifically focus on how photographs taken in physical museums are curated on social media platforms.

Ian Hutchby argues that "technologies can be understood as artefacts which may be both shaped by and shaping of the practices humans use in interaction with, around and through them."[15] In understanding technologies in this way they rank between an emphasis on the shaping power of human agency and the constraining power of technical capacities, which "opens the way for new analyses of how technological artefacts become important elements in the patterns of ordinary human conduct."[16]

Hutchby is one of many who focus on these affordances of technologies and media (such as Beck 1997) and social media in particular (such as Boyd 2011; Costa 2018; Kaun and Stiernstedt 2014). Bareither emphasizes the value of "highlighting practice theories' sensibility for actors' practical sense (embodied knowledge). The affordances offered by digital (poly)media do not only depend on situational contexts; they are also relational regarding the practical sense that actors apply when using them."[17] Material environments, and the objects that constitute them, become what they are once seen in relation to ordinary cultural routines and customs.[18]

This means that the affordances of a given material and digital environment can differ from context to context and from person to person. Whenever two or more individuals engage in a common activity, the affordances they experience can be shared or different. Carl Knappett calls this the 'sociality' of affordances.[19] Although some affordances are independent of people's interpretations, they only become meaningful through actions that in themselves are "contingent on people's self-interpretations – notions of who they are and what they are up to when engaged in an action – within what is for them a (more or less) meaningful world."[20] Understood in this way, affordances are an important tool for examining what social media platforms provide users vis-a-vis socio-cultural practices. Below we identify insights from affordance theories using an example in our work.

The Extraordinary in the Everyday
Museum Photographs on Instagram

Individuals who take photographs in museums and post them on social media, like everyone who interacts with the affordances of their environment, rely on routinized actions and behaviors bound up with internalized knowledge. The connections they create between museum spaces, art and current social discourses spring from a practical understanding of digital image technologies and social media. The links they build to recent events and debates "reflect social practices that already exist as part of people's everyday lives and experiences."[21] By posting visual content from the exclusive space of museums on social media, however, they inject the extraordinary into the medialized space of those everyday lives and experiences. Moreover, once digital images of artworks or museum spaces are placed on social media platforms, they afford opportunities for recontextualization and alternative meaning-making that go beyond the material qualities of the depicted artefacts or installations.

The example we consider below involves self-portraits taken by a young black woman in front of a painting by Pablo Picasso and the online debate on cultural appropriation it elicited. We will examine how the affordances of Instagram, a popular social media platform that requires all posts have visual content, shape the way users grapple with current political issues. The digital images of Instagram are, as Maria Schreiber has observed, "integral to networked interpersonal communication"[22] and "aesthetic products …, which allow explicit and implicit visual sense-making."[23]

Figure 1: Tayla next to a Picasso Painting. Created by Tayla Camp. Instagram. https://www.instagram.com /candidcurator/ (accessed December 11, 2020).

The example consists of three images. The first photograph shows Tayla, the post's creator, next to a preliminary study for one of the women featured in Picasso's celebrated *Les Demoiselles d'Avignon.* Tayla stands in a way that relates herself visually with the woman in the painting. Both are positioned laterally and face the beholder behind the camera. The second image shows *Les Demoiselles d'Avignon*, which many art historians consider "a curtain raiser or trigger to Cubism."[24] The third and last picture depicts a black-and-white photograph of Pablo Picasso in his studio in 1908.[25] It is worth noting that the portrait of the artist appeared on the cover of the opening invitation to Primitivism in 20th Century Art: Affinity of the Tribal and the Modern, an exhibition held at the Museum of Modern Art in 1984.[26]

Our ethnographic perspective is less concerned with the question whether art is understood "correctly" or whether the historical context has been taken into account appropriately; rather, the actors' individual practices of appropriation and subjective modes of interpretation are at the center of our analysis. In our field of research, the observed discussions and negotiation processes often deviate from the established, professionally curated and contextualized understanding of art. An aspect that has also been addressed by Tayla herself:

> I actively shy away from claiming to be an expert or an art historian, because I'm not. I'm simply someone who likes to learn about art and enjoys sharing what I find out, and I think that it is important to differentiate between the two because the latter is far more relatable for a platform like Instagram.[27]

In her interpretation of *Les Demoiselles d'Avignon*, she overlooks the complex social and cultural relationships that formed Picasso's work and the implicit criticism of western art traditions that it incorporates.[28] Tayla's photos of the paintings and her subsequent arrangement of them creates a visual narrative exclusively thematizing the iconography of female sexuality in Picasso's art and juxtaposes it with present-day values and norms. Her angry and indignant attitude towards the artwork, the way in which she criticizes the artist and her emotional and political reading of the historical context is a result of Instagram's affordances for inspiring emotional debates on topics of societal and political relevance, and less shaped by the characteristics of the museum space, which mostly suggest a more sophisticated and cautious discussion of the objects on display.

Practices of (Re-)Contextualization

The photographic perspective and digital reconfiguration of the examples are enhanced by practices of (re-)contextualization and categorization. Using captions and hashtags, Tayla sets her photographs of museum spaces in relation to alternative structures of meaning, relations and networks. For instance, the images she posts on Instagram are preceded by a provocative statement: "If anyone needed any further proof that Picasso was an asshole, this is the post for you."[29] As she discusses African art in Picasso's works and his ill-famed denial that such art influenced him, her texts become more personal, more political and more critical, turning to topics such as global imperialism, the objectification, exploitation and sexualization of African women and the disregard of black history.

Viewed in isolation, the platform's limited options for contextualizing visual content make it difficult to remove it entirely from their original location, such as a museum space. But if we take into account users' implicit media knowledge, it is possible to argue that the habit of using social media as a platform for everyday communication allows digital images to be placed in alternative frames of reference. The visual mediation of everyday life is part and parcel of the platform's economy of valuation and attention. Instagrammers like Tayla know how to use the platform's features in order to place content from unusual and unpopular contexts in an ordinary sphere that appeals to a larger audience. As Tayla explained to us in a chat interview:

> Everything I post is dictated by how I feel it will be received by my followers. I built up my account on giving insight into my personal interpretation of art and by drawing links to other topics that I think we should draw attention to. I think that is what really attracts followers. A good quality picture is important, but what really matters is that people can relate to the story you're trying to tell. You can see that the posts with the most likes and comments are those where I talk about my personal experiences and topics that are discussed in public and are on everyone's mind, this is what makes it really 'instagrammable.'[30]

The practice of (re-)contextualizing digital images is neither completely determined by the digital infrastructure of the platform in use nor is it a purely subjective practice on the part of the users. The platform's evaluation mechanisms encourage the creating and sharing of content that is recognized by a large number of people. Tayla understands very well that platforms like Instagram are meant to communicate personal experiences; she has learned that references to everyday issues and current affairs are appropriate behavior and generate appreciative attention. The most common ways to reframe visual content on social media in terms of the everyday are captions and hashtags.

Practices of Categorization

Tayla's photographs employ hashtags such as #blackhistory, #blackarthistory or #blackhistoryfacts to link them with a wide variety of posts that deal with these topics. Through these practices, she places the famous Picasso painting in the same context as photographs of the Black Lives Matter movement, self-portraits of naked black women, newspaper articles about growing racism in the U.S and memes of the newly elected Vice President, Kamala Harris.

As Haidy Geismar, who introduced the term "unruly archive"[31] to describe Instagram's emergent and fluid classificatory system, writes, "the hashtag is the device that collects and collates images bringing a second dimension to user accounts, and facilitating the social networking and image-networking component."[32] The clustering of images generates shared visual attention and sensitivity to certain events. A topic that is discussed publicly is likely to be a frequent hashtag on social media platforms, attracting users who want to help shape the formation of political opinions and the negotiation of socially relevant issues visibly and visually. The more users categorize their images with a particular tag, the more value is attached to the issues. As social practices, hashtags and captions are shaped by the digital infrastructures in which they are embedded and are constitutive in their maintenance.

"The physical and the virtual do not separately orbit each other,"[33] Kylie Budge writes, summarizing the view of many. "They intersect and overlap constantly and by necessity."[34] The everydayness of mediated communication practices is what allows users to connect pictures of museum spaces with other posts in such a way that they can co-exist as an integral part of more far-reaching discourses. "The mediation of everyday life with a technical apparatus that rationalizes and valorizes those communicative practices"[35] and assemble a wide variety of contexts into a mosaic with a single theme. And hashtags are the tools with which to recontextualize digital images from the art and museum world within topical debates.

Instagram's Interactive Potential

Digital images shared on social media platforms are, above all, points of reference for socially distributed practices. By liking and commenting on posts, online users participate in processes of visual sense-making. The interactive possibilities afforded by Instagram allow users to interpret, adapt, modify or even challenge visual content. In doing so, they circulate images, allowing other interested individuals and groups to take part in the "process of making choices about what is most meaningful to preserve and pass on to future generations."[36]

Within days after appearing on Instagram, Tayla's three photographs had received more than two thousand likes. In addition to signaling their appreciation, many users left comments about the images. Some praised Tayla for work she has done; some noted the readability of her posts; quite a few opined on her aesthetics or appearance; many supported her in her anger; others thanked her for shedding light on often overlooked aspects of modern art history; and there were some who vehemently disagreed with her recontextualization of the artworks.

Our previous work on social media platforms has shown that photographs of paintings, sculptures or art installations that communicate only the material qualities of the objects or the aesthetic experience of art exhibitions receive fewer comments and likes. Not surprisingly, such posts do not attract the same levels of participation, exchange and confrontation as images framed to respond to cultural and political debates. Sparking a discussion online was precisely what Tayla set out to do by taking the artworks out of their conventional contexts. She used her media savvy and the creative possibilities of the platform to create awareness and a sense of community. "[S]eeing artworks situated on their own, away from the context of a museum can be liberating, particularly to those who are unfamiliar with art history and do not frequent museums,"[37] she writes "I think it opens up the possibility to discuss certain aspects independent from professional knowledge."[38]

As a platform dedicated to everyday discourses, Instagram can take digital content from the art galleries or museums and assign them social or political value. This, in turn, opens attributions and patterns to larger online debates, as the following critical comment makes plane:

> "This is such toxic nonsense, aren't you appropriating Spanish culture yourself by claiming Picasso was a closet racist misogynist extrapolated from your toxic interpretation of Picasso's vague answer to the public? … But of course, nowadays having a well-studied answer or showing Picasso's normal side doesn't score as much points as calling him a racist misogynist."[39]

The comment's author accuses Tayla of getting caught in a modish preoccupation that sees racism and misogyny everywhere in order to obtain recognition for reproducing well-worn opinions and insights. Merely discussing Picasso's artistic talent, he suggests, would not have received as much attention as a post criticizing artworks for cultural appropriation. He understands that users of Instagram are incentivized to address trending topics that generate likes and followers. The debate revolves around two questions: should art be appreciated independently of an artist's life and character? And are discussions on social media fundamentally problematic given that media users are highly motivated to focus on the most attention-grabbing issues? However one answers these questions, it is the options afforded by the platform, the socio-cultural context and the actor's practical media knowledge that enable the recontextualization of digital images and the multitude of approving and disapproving comments.

In the following, we discuss some temporal elements of social media platforms and provide an outlook on how the technological realities of Instagram allow practices that stand to unsettle traditional structures of authority in the art world.

The Dialectic of Instagram

Anna Kaun and Fredrik Stiernstedt have noted that Instagram "structures temporal experiences."[40] Users are constantly confronted with rapid changes and the urge to update their profiles, because "new stories are continually appearing, pushing old stories out of sight, downwards in the stream."[41] Following the communication and media sociologist Maren Hartmann, we argue that the ephemerality and impermanence of Instagram's interface structure social interaction and hence is an integral part of how people create meaning on the platform.[42] For instance, every post, story and image in the Instagram feed is visible only for a short while before it disappears in the vast amount of digital content that is created and shared on the site nearly every second of the day. In a study on Facebook and media memory, Kaun and Stiernstedt write that "the visibility of content in the newsfeed stream is decided based on the closeness of the relationship between users, the importance of the interaction, and the currency of the post."[43] Our previous work suggests that it is the topicality of digital images that plays a decisive role for visualization and attention generation on Instagram. The platform's temporal structures encourage not only the constant and regular posting of visual content but also its embedding in current debates and events.

In contrast to the immediacy and amnesia of Instagram's interface is the long-term storage provided by its archive. Many of those we interviewed describe their social media profiles as galleries or diaries – a way to conserve personal impressions, experiences, memories, political events, social changes and controversial debates. What is published and perpetuated on the user's profiles and what is left to the transient flow and forgetfulness of digital time depends on a variety of interrelated factors.

The initial view of Instagram user profiles displays only images and hides the accompanying captions. It is understandable, therefore, that many Instagram users are keen to cultivate a total aesthetic. For instance, Tayla told us that she will not post a photograph if it doesn't match the aesthetic that she has built her following on, even if she loves it. "In these cases, I will post the work on my story only."[44] How the time structures of the platform are used, and which practices they afford, accordingly depend on the media knowledge of the users.

The story that Tayla mentions is typical of Instagram profiles. The categorizing and linking of digital images by means of hashtags enables collective storytelling, common narratives and the cooperative negotiation of social discourse. The technological affordances of the platform, Kaun and Stiernstedt summarize, are characterized by the dialectic of "fluidity, 'nowness', 'liveness', and change, on the one hand, and remembrance, archiving, preservation, and stasis, on the other."[45]

Shifting Authority?

Tayla's post, together with the discussion it generated, ethnographically engages with the changes of interpretative sovereignty in the digital realm. The question is whether Instagram and other social media platforms, by allowing users to recontextualize digital content through additional or alternative data, information, references, historical facts and political preferences, are shifting the authority to confer value on art and artefacts away from museums and towards individuals. Joel Taylor and Laura Kate Gibson, in critically examining the promise of a democratized heritage through digital participation, acknowledge that digital interactions constitute a process of interpretation that can be considered as "more polyvocal than didactic exhibitions, and therefore less dependent on expertise and institutional structure."[46] The circulation on social media of artwork from museums, we submit, is indicative of a similar shift. By detaching art from its institutional framework, social media users can put museum objects into new, more personal narratives and create alternative forms of meaning. Tayla's recontextualizing of the Picasso painting on Instagram adds critical perspective while playing the work within her everyday political discourse. She emphasizes the significance of the

influence and historical achievements of black communities and draws attention to the failure of cultural institutions to address them. Her clear and sometimes provocative language, her physical positioning and appearance work to break the museum's monopoly on appropriate forms of interaction with art and art history. Instagram's technological features give "people more confidence to share their versions of stories, and their thoughts and opinions about certain topics or objects."[47] When asked why she decided to share photographs of herself in museums and galleries, Tayla replied: "The story I wish to tell is that art history is also relevant to young audiences, especially to those who weren't necessarily exposed to art and museum culture from a young age. I hope that by seeing a young black woman with tattoos, my audience will understand that art history, which has historically been exclusionary, is now more democratic."[48] It therefore seems reasonable to argue that the platform's technology helps break down the exclusionary structures and the conventional spaces of interpretation.

Instagram should not be seen as "an inherently neutral and democratic space for sharing knowledge,"[49] however. Even as the platform enables the individual appropriation and democratic negotiation of value and meaning, its digital infrastructures reproduce and consolidate prevailing power relationships and patterns of visibility. What is exhibited in museums and art galleries and therefore photographed in the first place, which paintings, sculptures or installations are recognized as "Instagram worthy" and what content is taggable as art or art history are "socially and culturally determined."[50] That is to say, the participation and democratization enabled by the platform occurs within the framework of established power relationships. If platforms like Instagram shift authority away from institutions towards individuals, they also "in many ways, continue to produce new blind spots and new silences."[51]

Conclusion

In this article, we employed a relational understanding of social media affordances to discuss how Instagram enables the everyday integration of photographs taken in the rarefied spaces of museums and art galleries based on a specific case from the project *Curating Digital Images.* We focused on the routinized actions and behavioral patterns made possible by the platform and their entanglement with users' incorporated media knowledge. For it is people's habit of using social media for everyday communication that allows them to place digital images within alternative frames of reference. In examining practices of (re-)contextualization and categorization, we observed that the mediation of everyday life and public debates is something wholly determined neither by the digital platform nor by the users. Digital images on social media platforms are above all points of reference for socially distributed practices within an online economy of valuation and attention. By liking and commenting on posts, social media users participate in processes of visual sense-making. The interactive potential of Instagram extends users' ability to interpret, adapt, modify and even challenge visual content. In addition, we describe how Instagram's temporal structures afford the everyday practices of sharing, circulating and linking of digital images in a dialectic of impermanence and preservation. We then concluded by asking whether practices of digitally embedding photographs of museum artworks in everyday discourses indicates a change in who assigns value and meaning to art. We argued that the afforded practices of (re-)contextualization have helped shift authority from museums to individuals, albeit within the existing framework of established power relationships.

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[4] See Bareither 2020, 42.
[5] See Bareither 2020, 37.
[6] Ingold 1992, 44.
[7] Keane 2018 31–2.
[8] Ingold 1992, 50–1.
[9] See Ingold 1992, 51.
[10] Ingold 2000, 166
[11] Ingold 2000, 166–7.
[12] See Tröndle 2014, 16.
[13] Tröndle 2014, 16.
[14] See Eghbal-Azar 2016, 11.
[15] Hutchby 2001, 444.
[16] Hutchby 2001, 444.
[17] Bareither 2019, 12.
[18] See Bareither 2020, 38.
[19] See Knappett 2004, 47.
[20] Keane 2018, 31.
[21] Iversen and Smith 2012, 129.
[22] Schreiber 2017, 144.
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[24] Chave 1994, 596.
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[28] See Leighten 1990, 610.
[29] Tayla Camp, Instagram Post, September 21, 2020: https://www.instagram.com/p/CFZtKNoqDCA/ (accessed January 25, 2021).
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[33] Budge 2017, 70.
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[40] Kaun and Stiernstedt 2014, 1155.
[41] Kaun and Stiernstedt 2014, 1161.
[42] See Hartmann 2017, 373.
[43] Kaun and Stiernstedt 2014, 1161.
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Materiality, Embodiment and Affordance in Paul Grahams *a shimmer of possibility*

Hans Dieter Huber

Abstract

First, the question of what a material picture is and what is meant by an image is discussed. We do not clearly distinguish whether we mean a physical object, a pictorial representation or a mental image that arises in our brain. The pictorial surface of a material carrier is the interface between the physical picture and the mental image. In contrast, our way of speaking of a pictorial representation works quite differently. Material picture and pictorial representation are structurally coupled. The representation cannot exist without a material carrier. The material picture *embodies* the pictorial representation like the actor embodies the role. The pictorial representation is only partially determined. It contains spots of indeterminacy that are filled up by the viewer's imagination. Gibson invented the word *affordance* as a replacement for the concept of value. Affordances are what things offer a living being, what they 'provide' or 'allow' it to do. The fundamental problem with his theory lies in the attempt to construct a 'direct' and 'unmediated' approach to reality. The objectivism implicit in his theory oversees that affordances are neither 'given' nor 'direct' 'properties of objects. Affordances are the result of active attribution and evaluation by a scientific observer. The photographic series of Paul Graham's *a shimmer of possibility* exists in different materialities, namely as various photobooks and sequences of photographic colour prints on the wall, which provide different affordances. The photobooks and the photographic sequences are embedded into a space of potentiality out of which they are brought to actuality through a concrete process of aesthetic experience.

Introduction

My text is divided into four parts. Firstly the question is discussed what a material image is and what is meant by a pictorial representation. In the second part I will discuss Gibson's theory of affordances and propose a critical reinterpretation. I will argue that the concept of a material affordance is not suitable to describe what takes place inside an observer when he looks at pictures. We need to extend the limited theoretical basis to include visual, mental and aesthetic affordances. In the third part I will use Paul Graham's photo project *a shimmer of possibility* as an example of interpretation. In the fourth part, I will discuss the question of the various material appearances of the project and to what extent the photographs can be said to afford something to the viewer's aesthetic experience. My conclusion will be that the physical photographic object exists within a space of possibilities. Only if a viewer actually perceives and apprehends it, it is taken out of that space of potentiality and becomes a specific actuality as an aesthetic object. From this constituted aesthetic object different affordances can then retrospectively be re-attributed to the physical object as its 'properties.'

Different Ways of Talking About Pictures

Most of the time our talk of pictures is ambiguous. We do not distinguish whether we mean the picture as a physical object, a pictorial representation or a mental image that is created in our brain. I will use the term 'picture' for the physical object that exists in the world like any other everyday object. I will use the term 'pictorial representation' for a colour structured surface on the front of a picture. I reserve the term 'image' for the mental result of the perceptions, fantasies, attitudes, expectations, memories, prejudices and stereotypes of an observer. Colloquially, the difference between the two terms can be summed up with the phrase "You can hang a picture, but not an image."[1] Images in this last sense are always mental and exist in a completely different material domain, namely in the neurobiological, cognitive domain of the observer. I deliberately allude to the relationship between the terms image and imagination, since imagination plays a central role in the construction and synthesis of images in the cognitive domain.[2] The pictorial representation is embodied in the picture. It is at the same time a boundary between the front side of the material picture and the surrounding medium.

The pictorial representation on the outer surface of a pictorial carrier is the interface between picture and image. Whether this colour-structured surface is physical or mental depends on the side from which the boundary is observed - the material embodiment of the surface on the pictorial carrier or the colour-structured ambient light reflected from the surface and transmitted to the point of observation occupied by a person.[3]

The picture as a physical object is complete, three-dimensional and determined from all sides.[4] It has a front, four sides and a back. One can take the material picture in one's hand, turn it over, upside down, put it on the table, pack it or transport it. It can be perceived with all senses at the same time. The material picture is subject to the same physical, biological and chemical laws as all other things in the world. It ages and degrades depending on the specific environmental conditions to which it is exposed.

In contrast, our way of talking about a pictorial representation works completely different. A pictorial representation is a form that has two very different sides.[5] On the one hand, it is a materially produced surface, which as such can be physically damaged or destroyed. It exists only in the mode of potentiality. Material picture and pictorial representation are structurally coupled.[6] The pictorial representation cannot exist without its material carrier. The material picture embodies the pictorial representation like the actor embodies the role. When the material picture as a physical object decays or dissolves, the pictorial representation also dissolves. Material picture and pictorial representation therefore change in co-evolutionary drift.[7] On the other hand, it is already part of the perceptual apparatus of the observer. Pictorial representations in that second sense are colour-structured surfaces, which are only perceptible by sight and by no other sense. Without seeing there are no pictorial representations at all. The pictorial representation is the interface between the material picture and the mental image.[8]

James J. Gibsons Theory of Affordances

Gibson invented the artificial word affordance as a substitute for the concept of value, which for him was a philosophical legacy. As early as 1966 the term appeared in his book *The Senses Considered as Perceptual Systems*.[9] For several decades Gibson worked on a satisfactory definition of affordance, changing it over and over again because he was not satisfied with it to the end.[10] In the eighth chapter of his third and last book, *The Ecological Approach to Visual Perception* from 1979, James J. Gibson formulated his theory of affordance in detail.[11] But he is still not sure about his argument. 'Perhaps,' he writes, perhaps the surrounding optical arrangement and the layout of the surfaces of things constitute the affordance that an object offers an observer, is his thesis. Affordances are what things offer to the living being, what they 'supply' or 'allow' him. Affordances cut across the traditional dichotomy of subject and object. Environment and living being are complementary to each other.[12]

Gibson's theory of perception at the time was radical and innovative in several respects. His methodological approach was fundamentally different from the perceptual psychological methods and experiments known to date. Firstly, he assumed that observers see with two eyes and not with a single eye, and that the eyes are located in two eye sockets in which they can move back and forth in a complex way using the outer and inner eye muscles and focus on different objects in the immediate surroundings. The head, in turn, sits on a complicated neck joint made of atlas and rotator, which enables a complex movement of the eye-head system in three directions. This eye-head-neck system in turn sits on a movable upper body with two arms and a lower body with two legs, which actively moves around in its environment. The experimental psychology of perception before Gibson, on the other hand, usually assumed a monocular perception in a laboratory situation in which eye, head and body were fixed in order to eliminate them as intervening variables as far as possible. These extremely artificial laboratory conditions did not correspond at all to everyday perception situations and their experience. To my knowledge, Gibson was one of the first to make an observer actively moving around in space the basis of his theory of perception, thus defining the process of perception as a form of active action, as some philosophers and psychologists such as Alva Noë or Kevin O'Regan only understood it much later.[13]

Attempt of a Criticism

His concept of affordances cannot remain unchallenged. As radical, deviant, novel and forward-looking as his last book was, I am just as critical of his implicit ontology. With all his strength he wanted to hold on to the objectivity of the 'given' or defend it against the upcoming cognitive turn that made it clear that perception is mediated and filtered to the highest degree.[14] Like Johannes Kepler, he faded out all higher, emotional, cognitive or memory functions from his theory.[15] He does not deal with the question of how the visual construct that is constituted in the human visual system is further processed, connected to language and linked to expectations, memories or experiences in the higher regions of the brain.

This also applies to his theory of affordances. It is precisely this theory that has risen to new topicality in connection with the discussion triggered by Bruno Latour about the agency of things. The new developments in media ecology also make him visible as one of the possible pioneers of an ecological optic. Nevertheless, in my opinion there can be no question of the environment being perceived 'directly.' What we see are not the things themselves, but the medium that lies between the things and us.[16]

The fundamental problem of Gibson's theory of affordances lies in the attempt to construct a 'direct' and 'unmediated' access to reality. The objectivism implied by this concept forgets that affordances are neither 'given'[17] nor 'properties' of objects, but can only be attributed to an object in a concrete use situation with an observer-actor. Affordances are the result of active attribution and appraisal, not 'objective' properties of objects that can be observed 'directly'.

Indeterminacies in the Pictorial Representation

For the transformation of material pictures into the neurobiological dynamics of an observer, the concept of blank spots (*Leerstellen*) or spots of indeterminacy (*Unbestimmtheitsstellen*) is of central importance. The Polish philosopher Roman Ingarden first invented it for the interpretation of literary texts,[18] but later applied it also to music, painting, architecture and film. His argument is that, unlike a real object, in a pictorial representation not everything is completely determined. For example, in a literary text, the hairstyle or the eye colour of a person may remain unnamed in the description. In a photograph of a person from behind, the face is not recognisable. It can only be imagined.

These spots of indeterminacy can therefore only be supplemented in the imagination of the viewer. In contrast to a real person or object, which can be perceived from all sides, the unrepresented aspects of a pictorial representation remain undefined. According to Ingarden, pictorial representations are schematically constructed objects that exhibit spots of indeterminacy, which can only be concretised, supplemented and filled in during the aesthetic process.[19] The blank spots in images are the crucial joints for the synthesis of perception. The observer fills the places of indeterminacy that he/she has detected with his/her own imaginations, habits, prejudices or stereotypes. In doing so, he/she goes far beyond what is visible in the pictorial representation.

Strictly speaking, this argument is the ultimate end of any belief that pictures can 'afford' or 'offer' anything to the viewer. For both the talk of pictures/images and the talk of affordances are too vague. Certainly, the optical layout of a pictorial representation is the condition of the possibility of its aesthetic experience. However, for the cognitive system of a concrete observer, the optical layout is only a cause or a trigger for perturbation and irritation. The perturbations triggered by a pictorial representation move within a framework that defines the possible space of neuronal activities and cognitive stimuli. What exactly is processed and synthesised in the visual system or later in the brain can neither be controlled nor predicted by the material picture, despite retinotopia.[20] On the other hand, the perturbations cannot be processed completely arbitrarily, although there is enough freedom of perceptual interpretation. The pictorial representation embodied in the image carrier is the condition that defines the range of possibilities within which the subsequent concretisations and image syntheses of the observers can operate.

If one ties these considerations back to Gibson's theory of affordances, it becomes clear that images do not 'offer' anything by themselves, and that talking of what a picture can 'afford' is a shortened, elliptical way of speaking. A material image 'offers' only that which an acting actor or observer can understand as an 'offer.' A material picture that is not perceived as an affordance by an observer remains in a shimmering space of potentiality from which it can only be concretized through a specific act of perception. Affordances are therefore not objective properties of physical things, as Gibson believed. They are relative to a particular situation in which an observer likes to perceive a particular object *as an affordance.*

Paul Graham's *a shimmer of possibility*

In the years 2004-2006, the English photographer Paul Graham, who moved to New York in 2002, travels through the United States of America. In the summer of 2004, 2005 and for most of 2006 he photographs different sites in the country without a systematic approach, rather intuitively strolling, meandering and walking around. The result is twelve photo sequences of varying size, ranging from 27 photos to one single shot, most of which are titled after the place and the respective federal state. The whole work exists in various material forms, in several photobooks, the different photo sequences and various images on the Internet.

The materiality of an image is the condition of the possibility of its aesthetic experience. In what material form is *a shimmer of possibility* present to a viewer? For most people it will be in the form of the photobook.[21] It plays a central role in Paul Grahams work. He first develops order, arrangement and size of his photographs in his photobooks and then transfers this assembly to the photographic prints on the wall. But here too we have to ask: Which photobook are we actually talking about? There are three different editions, and therefore the physical access to the work can be very different, depending on which book you get your hands on.

The first edition, published in 2007, comprises twelve different hardback volumes bound in coloured linen in the format 24,6 x 32,2cm, which were produced and delivered in a limited edition of 1000 pieces in a white, printed cardboard box by the publishing house SteidlMACK, Göttingen (fig. 1).[22] The photographer decided to divide his work into twelve different, narrow volumes. They contain neither title pages nor page numbers. The last page contains only a colophon. The title *a shimmer of possibility* is printed on the front of the linen cover in white colour and in embossed print.

Figure 1: Paul Graham, *a shimmer of possibility*, first hardcover edition, SteidlMACK 2007.
Photo © Hans Dieter Huber 2020

In May 2009 *a shimmer of possibility* was published once again in a softcover paperback edition in a minimally smaller format of 24.2 x 31.8 cm and with 367 pages as a whole book (fig. 2). In contrast to the first edition, the photographs in this edition are overprinted with a light clear varnish to make the colours appear deeper and more saturated. The paper is thinner and glossier.[23] In 2018 the publishing house MACK Books London decided to reprint the twelve volumes. In the reprint edition, all volumes are bound in the same light blue-violet linen (fig. 3). The title is printed in the colours of the first edition. These are the three primary, material manifestations of *a shimmer of possibility*. Quantitatively speaking, most people will only have access to the paperback edition and no access to the 12 hardback volumes either of the first or the third edition or the original photographs.
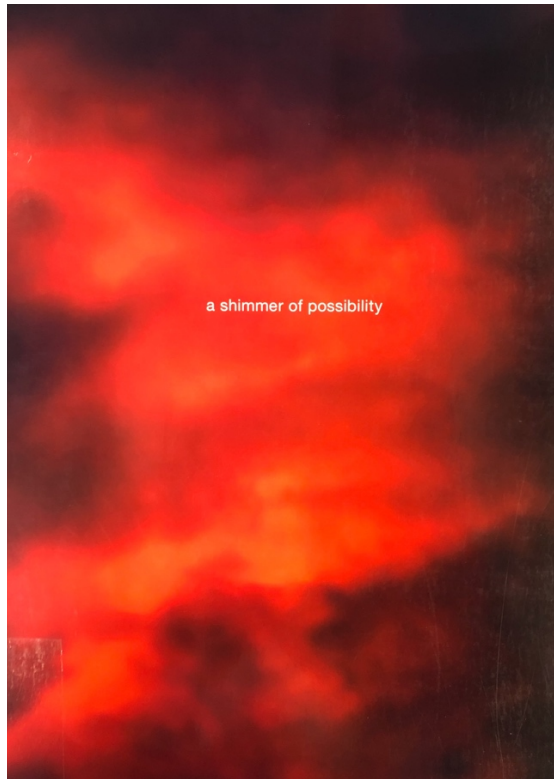
Figure 2: Paul Graham, *a shimmer of possibility*,
softcover edition, SteidlMACK, 2009. Photo © Hans Dieter Huber 2020

Figure 3: Paul Graham, *a shimmer of possibility*, reprint 2018.
Courtesy of MACK Books, London.

The Affordance of a Photobook

What form of aesthetic experience do the photobooks 'afford' the user? In the first edition there is no definitive order of the individual volumes. The viewer can take out any one of the volumes, open a random page and from there turn either forward or backward. Which of the differently coloured volumes a particular viewer will pick up first cannot be predicted from the design of the respective photobook. Therefore, it cannot be said which affordances such a hardcover volume will provide. The photobooks are apprehended highly selective. The constitution of the aesthetic object through perception is fragmentary, random and, - seen from the photobook 'itself'-, unpredictable. Nevertheless, the books offer the viewer something to see. But what this is can only be recognised through the process of seeing itself and through no other sense.[24]

If an observer takes a certain volume of the first edition into his hands, the entire photographic project enters a space of possibilities that allows a different temporal sequencing of the aesthetic experience and thus produces a genuine constitution of the aesthetic object. The aesthetic experience of the photobook of *a shimmer of possibility* is embedded into a sequence of temporal horizons in which memory and expectations continuously merge.[25]

In the softcover paperback edition, however, this order has been established once and for all. The viewer who leafs through this book is fixed in the order of his aesthetic experience. It is imposed on him by the dictatorship of binding, which establishes a clear and irreversible order of the twelve photographic sequences. However, if he uses the reprint edition of 2018 (fig. 3), all twelve volumes of the edition look the same for the time being. Even the linen cover signals that all sequences are equally important and significant, that there is no beginning, no end and no specific order of the aesthetic experience. A specific aesthetic experience of an observer and hence the affordance of the book is only realised through the actual, successive aesthetic action of leafing and looking.

Due to the fact that there are three different material manifestations of the photobook, one can conclude that *a shimmer of possibility* offers its viewers not just one, but at least three different spaces of possibilities for their aesthetic experiences, which can never be fully exhausted.[26] An actual aesthetic experience is always the concrete and specific realisation of an affordance that becomes actual within a chosen space of possibilities.

The Materiality of the Photographs

But there is another, more significant manifestation of this work, namely the presentation of framed photo sequences in an exhibition. Which materialities and affordances does a viewer encounter when confronted with such a framed, enlarged, glazed and mounted version of the sequence on the wall?

The ten panels consist of so called *colour coupler prints,* also known as C-prints.[27] They are framed flush with an angular white frame and with a spacer strip at a distance of about 1 centimetre (fig. 4). The framing was carried out by the company John Jones, London on 5 September 2007 using "museum-standard framing," in which the glass is low-reflective and filtering the ultraviolet light. The back of the frame is fitted with a diagonal, bevelled, four-sided hanging strip, which is connected to the white frame strip. In addition, the joint was sealed dust- and airtight with a brown, 12 mm wide, water-soluble adhesive tape. Four spacers made of transparent plastic as well as two hanging loops, which are attached to the sides, complete the back of the frame (fig. 5).

Figure 4: Paul Graham, *a shimmer of possibility*
(Austin, Texas 2006) detail of frame. Photo © Hans Dieter Huber 2020

Figure 5: Paul Graham, *a shimmer of possibility* (Austin, Texas 2006)
detail of backside of plate 5
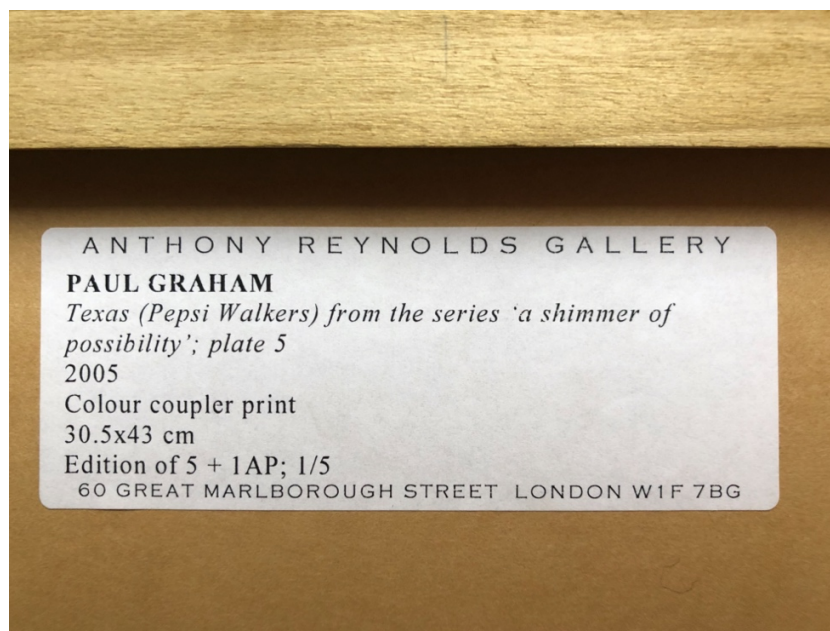Photo © Hans Dieter Huber 2020

Figure 6: Sticker of Anthony Reynolds Gallery, London, 2007.
Photo © Hans Dieter Huber 2020

Figure 7 and 8: Sticker of Sotheby's, London, 2017.
Photo © Hans Dieter Huber 2020

Furthermore, it contains four stickers with valuable information. The most important is from Anthony Reynolds Gallery, 60 Great Marlborough Street, London. It contains the artist's name, the title of the work *Texas Pepsi Walkers* from the series *a shimmer of possibility; plate 5*", which in this case differs significantly from the title and the year in the photobooks (fig. 6). It dates the sequence back to the year 2005, although the photobook indicates 2006 as the year of creation. Furthermore, the sticker contains information about the size of the photograph, the number of the plate, the size of the edition (Edition of 5 + 1 artist print) and the number of the edition (1/5). Then there are two stickers from Sotheby's London, where the work was auctioned in 2017, containing the lot number 216, the number of sold pieces (pcs 10) (fig. 7) and the name of the photographer, Shot-Donald (fig. 8).

Photographic Sequences in Exhibitions

The American documentary photographer Allan Sekula in an interview with Fritz Gierstberg in 1998 made a remarkable distinction between a series and a sequence.[28] With a series, you can see how the whole functions after only 2-3 examples. You can leave out single objects without the character of the series suffering or being destroyed. With a photographic sequence, however, this is different. It needs special markings of the beginning and the end. A sequence is always a whole. The complete work of *a shimmer of possibility* consists in a series of twelve different photographic sequences. The complete series never needs to be shown in its entirety. However, the individual photographic sequence must always be shown in full.

The affordances an artwork offers can be quite different depending on the situation of the encounter.[29] When a viewer enters a public exhibition space, the aspect of aesthetic education is the focus of interest. But when a viewer enters a private gallery, the situation is different. Here it is a matter of purchase. The question of how expensive such a photographic sequence is and whether it is still available for purchase at all is standing in the room. *A shimmer of possibility* was first exhibited at Anthony Reynolds Gallery, London from September 13 to October 14, 2007. Austin, Texas 2006 was installed over a corner (fig. 9). The first five photographs were hanging on the left wall and the second five photographs on the right wall. The hanging was done by the artist himself.

Figure 9: Installation view of Paul Graham Austin,
Texas 2006 from *a shimmer of possibility* at Anthony Reynolds Gallery, London 2007.
Photo: Courtesy of the artist and Anthony Reynolds Gallery, London.

One and the same photographic sequence affords something completely different in a public exhibition space than in a private gallery. In a museum, viewing the work educates the viewer aesthetically. In 2012, the photographical sequence Austin, Texas was shown at The Douglas Hyde Gallery, Dublin (fig. 10). The arrangement of the photographs is slightly different. The pictures are hanging on a single wall and the viewer can approach them orthogonally. Once again, the hanging was done by the artist himself.

Figure 10: Installation view of Paul Graham, Austin, Texas 2006
at The Douglas Hyde Gallery, Dublin 2012.
Photo: Courtesy of the artist and Anthony Reynolds Gallery, London.

In a gallery or auction house, the artwork affords a price at which it can be purchased. A gallery or auction house is acting like a broker or agent who offers a work of art he or she has suggested as relevant for an audience. However, demand must be added to supply. The gallery cannot force this. One edition of the photographic sequence of Austin, Texas 2006 was sold at Sothebys, London on October 6, 2017. The pictures hung in two rows, an assembly which Graham often uses, also for other sequences of *a shimmer of possibility* (fig. 11).

Figure 11: Installation view of Paul Graham Austin, Texas 2006 at Sothebys, London 2017.
Photo © Sotheby's 2017.

If the photographic work is already in a private collection, on the other hand, the situation is quite different. The work is located in an everyday environment. In contrast to the museum's presentation, which still refers to the ideal of the white cube,[30] it is integrated into the daily life of the collector's family. The work 'lives' with the collector. Shelves, cupboards, tables, chairs, lamps, vases, objects are assembled in the house, i.e. things that, according to the ideology of the white cube, only disturb and irritate the purely aesthetic experience.

Size and Affordance

When we talk about the photographic sequence *Austin, Texas 2006*, something must also be said about the different sizes of the photographs. Size is a component of the material body of the photograph in contrast to the scale of the pictorial representation, which is mainly defined by the camera setting. The photo sequence *Austin, Texas 2006* has four different sizes. The photographs number 1, number 5, number 7 and number 10 have the smallest size of 30.5 × 43 cm. Numbers 2, 4, 6 and 9 are slightly larger, namely 35.5 × 49.5 cm. Both sizes appear four times in the sequence. A third picture, measuring 53.5 × 56 cm, is number 3, which shows a black woman and a black man waiting at a waste bin. The largest picture is photograph number 8, 63.5 × 89 cm, which shows two children playing in a garden.

Small pictures can be controlled more strongly by the viewer's gaze than large pictures, which have a slightly immersive effect and draw the observer deeper into the depicted space. While small pictures tend to have an abstracting and distancing effect, the opposite is true for larger pictures. They seem more emotional and engaging. The size of a picture therefore always defines the way it addresses the viewer in the dimensions of distance and closeness.[31]

The size of a photograph functions as a condition of the possibility of its aesthetic experience. The viewer places himself in relation to the physical objects on the wall by means of his own body and its own bodily size. He usually approaches smaller pictures at a closer distance than larger ones. Large pictures cannot be seen all in once at a close distance from the picture surface. The temporary arrangement of the photographic sequences rhythms the aesthetic experience not only in a horizontal and vertical choreography but also with regard to a change in the distance of the viewer from the individual picture. The different sizes of the pictures allow a rhythmic distancing and approaching.[32]

The Pictorial Narration

Four factors determine the visual narrative.

Firstly. Theoretically spoken, all ten photographs could have the same size. But they do not. The tact that the ten photographs set by their order is transformed into a rhythm by the different size. The rhythm corresponds to a different temporal extension in aesthetic perception.

Secondly. In theory, all ten photographs could have been hung at the same eye level. But Paul Graham determined this differently. The ten photographs are hung at different heights on the wall. This interplay with the viewer's eye point gives the rhythm an additional melody. The higher hanging pictures seem lighter and higher in tone than the lower hanging ones, which sound darker and more bassy. In between, with the two large single pictures two 'solos' are inserted, interrupting the melody and rhythm of the sequence and extending it into a secondary narrative.[33]

Thirdly. The optimal viewing distance for an observer resulting from the need to adopt an optimal viewing angle changes from photograph to photograph. This creates an additional third dimension to the horizontal left to right sequencing and its vertical variation. It results in a dynamic perceptual action in distancing and approaching from the wall. Paul Graham thus brings the viewer into an active, physical four dimensional dynamic of movement through the variation of size, eye point and distance.

Fourthly. The attitude with which the photographer photographs the two protagonists and the edit play a central role in the pictorial narration. In the first picture it is a long shot. In the second picture the photographer moves closer to his protagonists and photographs them in a so called american shot.[34] Then follows the first solo picture with a central composition that suggests calm and duration. This is followed by a head and shoulder close-up shot taken from a very close distance behind the couple, which almost represents an infringement of their intimate space. The woman's left shoulder is cut by the frame. The photographic view is concentrated on the man, his left arm and the two packs of 12 Pepsi cans. (no. 4).

Then follows the centre of the photographic sequence with photographs 5 and 6, where it becomes clear that the photographer is increasingly concentrating on the man and looking at him more closely than before. In photograph 5 the view widens again towards a medium shot with normal focal length. The couple is photographed from a slightly elevated camera position at the height of the woman's hairline, so that parts of the lawn and pavement become visible. In photograph number 6 the man is then isolated from his female companion and placed in relation to his surroundings, a cemetery. The woman has completely disappeared from the picture. The man is slightly out of focus. Instead, the camera

focuses on the graves of the cemetery. The man is again shot in a mid shot. But this time he is photographed from a greater distance, i.e. with a smaller focal length. Probably Graham used a zoom lens. But this time the eye point is lower than in the photography before. Graham must have held the camera a little lower when taking the shot. Already in the act of photographing Paul Graham varies his camera shots through different focal lengths, eye points and depth of field. In photography number 7, there is suddenly a great distance between the viewer and the protagonist. The photographer stays behind the couple. He takes the picture of the people now walking on a left boardwalk from a distance of about 10 metres.

The largest picture of the series shows a yard with two playing children. If you look closely you can see that the colour of the children's clothes echoes the clothes of the white couple. The boy wears a red t-shirt with white sleeves and a black jeans, while the girl wears a white blouse and a turquoise skirt. The penultimate photograph shows the couple crossing a street in a residential area without any boardwalk. In the last photograph they disappear on the horizon. The photographer stays behind and does not follow them any further.

The Affordances of the Pictorial Narration

What a photographic sequence affords a viewer for his aesthetic experience is determined on the one hand by the depicted scene, its size and scale and the spatial arrangement of the single photograph within the sequence. On the other hand, these affordances frame a space of possibilities which is only transferred to actuality when it is translated by an active viewer into a coherent emotional-cognitive narrative. If one looks at the blank spots that exist in and between these images, it becomes clear that these spots of indeterminacy are the decisive interfaces of the whole photographic sequence, which transform the affordances provided by the physical object into a specific emotional-cognitive dynamic of the viewer.

What can be described as the affordance of a photographic sequence can in no way be an objective or absolute property of the physical pictures. What a photograph offers is relative both to an observer and to place, time and social milieu in which the encounter takes place. The question of affordances is thus of double ontological relativity. From the point of view of the respective object, therefore, only a range of possibilities can be determined, within which a possible affordance only functions if it is accepted by an observer or actor.

Summary

The analysis of Paul Graham's *a shimmer of possibility* has produced several findings. Firstly: Our talk of pictures and images is ambiguous. With the term *picture* I mean a physical, material object that is determined on all sides. The pictorial representation on the surface of a material carrier, on the other hand, is only partially determined. It is a schematic structure that can only be apprehended with the sense of sight. Secondly: The material picture embodies the pictorial representation and is the condition of the possibility of its aesthetic experience. Thirdly: The photographic series of Paul Graham's *a shimmer of possibility* exists in different materialities, namely as photobooks and as photographic colour prints on the wall. It spans a space of aesthetic potentiality, which is only actualised through the specific concretisations of the viewer. Fourthly: Due to the numerous spots of indeterminacy, the viewer goes far beyond what is visibly represented in a way that cannot be verified or controlled from the material pictorial object. The observer completes these blank spots of representation with his own imagination. Fifthly: The fragmentary nature of a pictorial representation is transformed into a complete, coherent pictorial narrative by the viewer's cognitive system. The spatial, temporal and social discontinuities that exist between the individual pictorial representations are translated into a spatially, temporally and socially continuous and full pictorial narrative. It is the autonomous, auto poetic activity of the actor that constructs a visual narration in his mind that, seen from the environment, cannot be foreseen, controlled or forced. Sixthly: The theory of affordances, as developed by James J. Gibson, must necessarily be supplemented by a theory of actual genesis and synthesis of perception. Only the two together describe the dialectical achievement of understanding images.

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Notes

[1] For a discussion of the image/picture difference see Mitchell 2009, 323-324.

[2] Huber 2010.

[3] Gibson 1979, 65-92, esp. 69.

[4] Ingarden, 139-143.

[5] "We take as given the idea of distinction and the idea of indication, and that we cannot make an indication without drawing a distinction. We take, therefore, the form of distinction for the form. [...]That is to say, a distinction is drawn by arranging a boundary with separate sides [...]. Once a distinction is drawn, the spaces, states, or contents on each side of the boundary, being distinct, can be indicated. There can be no distinction without motive, and there can be no motive unless contents are seen to differ in value." Spencer-Brown 1979,1.

[6] On the concept of drift and its evolutionary function, see Maturana 1988, 833: "The dynamic structural relations of a unit with its medium, through which this unit maintains its identity (...) I call >structural coupling< (or >structural adaptation<). This coupling becomes visible through the everyday practice of the observer. For the existence of any unit, the preservation of its identity and the preservation of its adaptation are thus constitutive conditions. As constitutive conditions for the existence of a unit the preservation of identity and the preservation of adaptation are interdependent conditions, so that with the loss of one condition the other condition is also always lost and the unit no longer exists. When this happens, a complex unity dissolves while a simple unity disappears." [own translation]

[7] Maturana 1990, 73.

[8] Husserl 1984, 437: "The painting is only a picture for a picture-constituting consciousness, which, through its imaginative apperception (here, therefore, founded in perception), gives a primary and perceptually appearing object the 'validity' or 'meaning' of a picture. [own translation].

9 Gibson 1966, 285: „When the constant properties of constant objects are perceived (the shape, size, color, texture, composition, motion, animation, and position relative to other objects), the observer can go on to detect their affordances. I have coined this word as a substitute for values, a term which carries an old burden of philosophical meaning. I mean simply what things furnish, for good or ill. What they afford the observer, after all, depends on the properties."

[10] See inter alia Reed/Jones 1982, ch.4.9, esp. 404; Reed 1988, 54f., 293f.

[11] Gibson 1979, 127: "I have described the environment as the surfaces that separate substances from the medium in which the animals live. But I have also described what the environment *affords* animals, mentioning the terrain, shelters, water, fire, objects, tools, other animals, and human displays. How do we go from surfaces to affordances? [...] Perhaps the composition and layout of surfaces *constitute* what they afford. If so, to perceive them is to perceive what they afford. This is a radical hypothesis, for it implies that the 'values' and 'meanings' of things in the environment can be directly perceived".

[12] Gibson 1979, 127.

[13] Noë/O'Regan 2002.

[14] Neisser 1967, Posner 1974.

[15] Kepler-van Dyck/Caspar 1937, Vol.2, 151. For a more detailed discussion see Huber 2007, 185.

[16] Aristoteles-ed. Barnes, 1984, Vol. 1, 667 (419a12-21) and 691 (434b 25-29): "The following makes the necessity of a medium clear. If what has colour is placed in immediate contact with

the eye, it cannot be seen. Colour sets in movement what is transparent, e. g. the air, and that, extending continuously from the object of the organ, sets the latter in movement. (...) Seeing is due to an affection or change of what has the perceptive faculty, and it cannot be affected by the seen colour itself; it remains that it must be affected by what comes between. Hence it is indispensable that there be something in between - if there were nothing, so far from seeing with greater distinctness, we should see nothing at all. [...] if they are to survive, they must perceive not only by immediate contact but also at a distance from the object. This will be possible if they can perceive through a medium, the medium being affected and moved by the perceptible object, and the animal by the medium. "For a broader discussion see Huber 2007, 125.See also Spencer-Brown 1979, xxv: "... the work of Einstein, Schrödinger, and others seems to have led to the realization of an ultimate boundary of physical knowledge in the form of the media through which we perceive it."

[17] Sellars 1963.

[18] Ingarden 1973, 249, 251f.

[19] The extent of this autonomous neuronal activity in relation to the perceptual perturbation can be made clear by a comparison. The output of a single ganglion cell in the retina can cause the activity of far more than thousand cortical neurons in the occipital, parietal and temporal lobes of the brain. This cortical activity, which is a thousand times greater than that of retinal irritation, leads to a complete and uniform perception of the visual environment in a way that is as yet unexplained. See Bear/Connors/Paradiso 2017, 331-367.

[20] Bear/Connors/Paradiso 2017, 342-343.

[21] Meanwhile there exists a vast literature on the photobook which I follow only in parts and with reservations. See among others Parr/Badger 2004-2014, Di Bello/Zamir 2012, Photography at Valand Academy, University of Gothenburg/ Hasselblad Foundation/Art and Theory 2013, Graf 2013, Siegel 2016, Siegel 2019.

[22] It was out of print within 10 weeks of its publication and is today considered a paradigmatic milestone of the photobook, redefining what a photobook can achieve.

[23] This second edition is also completely out of print and can only be purchased antiquarian at a much more expensive price. In November 2011 the book received the Paris Photo-Aperture Foundation Photo Book Award in Paris for the most important photobook of the last 15 years.

[24] Huber 2004, 163-167.

[25] Husserl 1980, 399: "If we now relate the talk about perception to the differences in the circumstances in which time objects appear, then the opposite of perception is the primary memory and primary expectation (retention and protection) that occur here, whereby perception and non-perception continually merge into one another. "[own translation]

[26] Sartre 1994, 11-13.

[27] Later editions of the series were executed in ink-jet printing. (communicated by Nadine Lockyer from Anthony Reynolds Gallery in an eMail to the author dated 17.12.2020: "The entire series of shimmer was not printed in one go and Paul moved to printing pigment ink prints around this time which is why the very first prints are colour coupler but then pigment ink about a year or so later."

[28] "The photographic sequence is an alternative to the dominant institutional model for organizing photograph in re-sortable groups: the curatorial and bureaucratic model of the archive and the series. Sequences can in fact contain series, can even be organized from the interweaving of serial elements, but the opposite is not the case. Series introduce a metronomic regularity to the parade of photographs, allowing individual images to be bought and sold with no compunction about loss of complexity of meaning. This is in fact one pleasure

of the serious. Sequential organization, and the parallel construction of textual elements, allow a photographic work to function as a novel or film might with a higher more complex level of formal unity. However, the openness of the sequential ensemble constitutes a crucial difference with cinema. There is no unilinear dictatorship of the projector. Thus it is easy to mistake the sequence for a series; for example, beginnings and endings require special marking if a sequence is to be recognized as such." Gierstberg 1998, 5f.

[29] For a more elaborated view on the role of situations for aesthetic experiences see Huber 2019.

[30] O'Doherty 1986.

[31] In the late 19th century, Hermann von Helmholtz already referred to seeing with two eyes and the resulting differences between the perception of small and large paintings in his text *Optisches über Malerei:* "Large paintings therefore give a less disturbed view of their subject than small ones, while the impression on the single resting, unmoving eye of a small, close painting could be exactly the same as that of a large, distant one. Only in the case of the near one, the reality that it is a flat surface constantly imposes itself on our perception much more powerfully and clearly." Helmholtz 1884, 102. [own translation]

With small pictures and from a close distance, it is easier to see the pictorial surface and the medium and it is more difficult to obtain a spatial imagination of the represented scene. With large pictures it is the other way round. Here it is easier to perceive the image space and more difficult to observe the pictorial surface and the medium. Paul Graham plays with this distinction in a very conscious way. He lets the viewer's eyes jump back and forth between the picture surface and the image space. For an extended theoretical and historical discussion about the differences between the perception of small and big pictures see Huber 2004, ch. 7.

[32] In the Renaissance, in connection with the edge distortions of perspective depiction, there was a broad discussion about the maximum angle of vision at which an image should be seen. This angle was determined between 45° and 60°. For the role of life size in pictures and an optimum viewing angle of 60°, see a more detailed discussion in Huber 2005, 229.

[33] Badger has also recognised the usefulness of musical metaphors for the interpretation of photobooks or photographic sequences: "In other words, when putting together a photographic sequence it is useful to think of musical qualities like point and counterpoint, harmony and contrast, exposition and repeat. There should be an ebb and flow to a photobook narrative, it should get 'softer' here, 'louder' there, 'quicken up' in visual terms, or slow down, and it should build naturally, if not to a climax, at least to a resolution. When he was referring to Paul Graham's photographic 'short stories,' or 'filmic haikus' in his book *a shimmer of possibility*, John Gossage emphasized just how necessary it was to have 'stopper' pictures, like climactic notes or deliberate discords. 'Stoppers' make us pause, they are subtle devices to hook us, alluring images that make us pause and ponder. And, as Gossage says, they are vital in making 'the book more complex, not just a group of sequences.'" Badger 2013, 19.

[34] For the american shot see Hickethier 2012.

The Representation of Pointed Amphorae in Athenian Vase Paintings: An Iconographic Study

Yael Young

Abstract

The article examines a group of images on Athenian ceramic vases in which pointed amphorae are depicted in various usages. This iconography appears primarily in the contexts of both the symposium and the komos, whose participants, along with members of the Dionysian thiasos, are shown sitting, leaning, playing, beating, and masturbating with this vessel. The utilization of this specific mundane object in such a manner is explored in light of psychologist James J. Gibson's term 'affordance', which refers to the potentialities held by an object for a particular set of actions, stemming from its material properties. Two additional terms, discussed by Beth Preston, that may help in analyzing the images are 'proper function' referring to the normative usage of objects, and 'system function', referring to the unorthodox usage of objects. The affordances of the amphora, stemming from its shape and material and the inherent potentialities for action, are perceived and exploited by the users. Though not from the outset designed as a chair, a toy, or a sexual device, in the hands of these figures and within the specific space of the symposium and the komos, the ordinary pointed amphora takes on those functions. Thanks to the Athenian vase painters, we are able to register and visualize latent affordances of the amphora that previously lay out of sight. It seems that in the context of the Athenian symposium and komos, what matters is the possibilities for action and that they be stretched to the maximum.

Introduction

Among the variety of clay vessels represented on Athenian decorated vases, the pointed amphora is one of the most common (Richter and Milne 1935, 4). Bearing a conspicuous typical shape and destined to transport wine and other products, we can find it in numerous symposium and komos scenes, mainly in the red-figure technique. In those scenes, we see the pointed amphora handled and carried by means of its handles, body, and tip, as it performs its designated task of transporting its contents, which while in real life might have comprised any one of a number of substances, in the context of vase painting is chiefly wine. However, alongside these representations lie quite a number of depictions of the pointed amphora in usages that can be classified as abnormal, and that some term downright 'abusive'. These depictions are the focus of the present study. My purpose is to examine them in light of the concept of 'affordance' and the function and usages related to it. I suggest that through this theoretical framework, we may better understand the images and the human-object interactions they reflect. Placing these depictions under one grouping will allow us examine a broad spectrum of usages through the narrow lens of a few specified terms, and thus to discover what they have in common. This, in turn, will ultimately bring us to a better understanding of how the pointed amphora was conceived by Athenian vase painters.

Theoretical Framework: Affordances and Function

The term affordance was originally coined by the perceptual psychologist James J. Gibson in the late 1960s, and was introduced in its full-fledged form in his book *The Ecological Approach to Visual Perception*, published in 1979 (127–137).[1] A definition of the term may be quoted from this book:

> The affordances of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill. The verb *to afford* is found in the dictionary, but the noun *affordance* is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment (Gibson 1979, 127).

Gibson viewed the environment not as an objective, abstract reality of physics or geometry, but as an ecological one, specified in relation to the organism it surrounds and the interactions their relationship affords. Gibson claimed that when we explore the environment, we do not perceive physical objects, with their particles and atoms; rather, we[2] perceive what these objects offer us, what we can do with them. On which object can we lean? Which can we grasp and how? Gibson stressed that we perceive affordances directly. Affordances, or clues in the environment that indicate possibilities for action, per Gibson, are perceived in a direct, intuitive way.

Over time, the term affordance migrated to other disciplines and underwent some modifications.[3] In its current iteration, the term refers to the potentialities held by an object for a particular set of actions. In its essence, it lies between humans on the one hand and the features and properties of the objects surrounding them on the other; and it connects the needs and abilities of the two respectively. Indeed, because affordance is all about the relationship between people and things, it is unsurprising that it became a key concept in material culture studies in general (Woodward 2007, chapter 8) and in archaeology in particular (Knappett 2004, 45ff.; Hurcombe 2007, 105; Hodder 2012, 48–50; Hurcombe 2014, 5–10). The term is now in the process of gradually entering Classical studies too (Rehm 2002, 14–17; Franco 2014, 166–171; Gaifman and Platt 2018, 408, 413; Osborne 2018, 240, 246–247; Meineck 2018, 53). Alongside the recent and growing interest in the meaning and power of objects, the theory of affordances can and should serve as a basic building block in considering the handling and usages of objects, for the tactile touch between object and body occurs at the very moment when affordances surface and come into play.

Two features constantly emphasized by the scholars who developed the concept are its relationality and its intentionality. In terms of the former, we invariably perceive the affordances of an object in relation to our physical dimensions (Heft 1989, 3–6; Glăveanu 2012, 196–199). An example is grasp-ability: if we wish to grasp an object, its size must be scaled to fit our palm and fingers, and its weight to correspond to our physical strength. In terms of the latter feature, intentionality, we know that the way in which we use an object is related to our goals and needs. Any given object may possess many latent affordances, but which of these will surface depends on the situation.

Contemporary scholars additionally like to emphasize affordance's sociocultural dimension. The way in which we engage with objects is dictated mainly by social norms. Here, we may introduce two more terms relating to the function of objects that may prove helpful in the current discussion: 'proper function' and 'system function'. Both terms are thoroughly discussed by Beth Preston, the latter being coined by her (Preston 2000; Preston 2013: 134–160). 'Proper function' refers to the intended usage for which the object was designed and shaped and is mainly oriented towards normativity. 'System function' refers, in Preston's terminology, to the actual usages of an object, which in many cases deviate from its intended usage and are mainly oriented towards idiosyncrasy. Preston adopts a pluralistic approach to function and, for her, proper function is not favored over system function. They are not competing but rather complementary terms, able to exist in tandem and, potentially, in a dialectic relationship to each other.[4] While Preston does not mention the concept of affordance in her writings, it is clear that both functions are based on affordances, inasmuch as they invariably depend on the material features of the object. Affordances determine what can be done with a certain object and what is impossible to do. The proper function is supported by 'canonical affordances', a term indicating that designed objects "already embody human intentions" (Costall and Richards 2013, 87), while the system function is supported by latent affordances, that is, material features inhering within the object, which were not initially meant to support usage and action but nonetheless do support them in practice. For example, the proper function of a chair is as a seat, but it can also be used as a ladder, and this is a system function.[5] Aside from affordances of real objects in real situations, as in the above, affordances of objects may surface in images too. In dealing with ancient societies, we lack direct experience and must of necessity fall back on limited available evidence, among them representations of various types. Visual representations are a primary source for the understanding of the interaction between humans and objects and of the potential actions they afford. Andrew Shapland applied the term affordance to Minoan art objects, especially in interpreting human-animal relationships (Shapland 2010a; Shapland 2010b; Shapland 2013). Continuing this pioneering application, I have recently applied elsewhere the concept of affordance to a group of Athenian vases decorated with scenes depicting adults hitting subordinates, such as children and prostitutes, with a sandal (Young 2020). I will now proceed to apply the term affordance to the various usages of the amphora, as depicted on Athenian vases, and thereby to explain the meaning and implications of this choice.

The Pointed Amphora in Athenian Iconography:
Affordances and System Function

The transport amphora – whose characteristic knob or tip gives rise, when described in relation to vase paintings, to its being referred to as the 'pointed amphora' – is one of the most ubiquitous types of clay vessel in the ancient world.[6] In the changing world of Greece, from the Archaic and Classical periods through the Roman Empire and beyond, the usage of this vessel as the primary carrier for goods, both trade and exchange, is quite continuous (Panagou 2016, 313; Sauer 2018, 33). Filled with various commodities (Panagou 2016), these containers travelled around the markets of the Mediterranean basin and, following their arrival at their destination, continued to be reused in a variety of ways (Grace 1979, unnumbered pages 8, 9; Lawall 2000; Twede 2002, 103; Lawall 2011, 43–47).[7] During the Archaic and Classical periods, their design mostly derived from the region of manufacture (Twede 2002, 103; Lawall 2014, 156–158). However, all transport amphorae share the same general formal features: they are rather large vessels with a narrow neck and two vertical handles, one on each side, and their lower extremity is shaped like a knob or a tip of various shapes, serving as a third handle when inverting the vessel (Grace 1979, unnumbered pages 1–2; Twede 2002: 98; 101). In most cases they have an ovoid body. They come in diverse sizes, corresponding to capacity ranges from 7.1 liters to nearly seventy-five liters (Koehler 1986, 56).

These amphorae first appear in Athenian iconography in several black-figure vases, mainly in the context of wine and oil selling[8] and in relation to Dionysos and his entourage.[9] Their occurrence is not all that common. Helga Gericke (1970, 108–109), under the general heading "amphora", has listed only thirteen instances on black-figure vases, and some of these have a flat base, reducing the number of pointed amphorae even further. While it is true that some depictions listed in the BAPD are missing from this list;[10] it nonetheless remains obvious that the pointed amphora was not frequently depicted on black-figure vases. Working within the framework of the terms explained above, we clearly see that the images on black-figure vases present the amphora in its proper function, namely the transportation and distribution of products. They are handled and held in a manner supported by the canonical affordances of the amphora, that is to say by the handle, tip, and body. This situation changes dramatically with the transition to the red-figure technique, ca. 530 BCE. Here, Gericke (1970, 109–111) has listed sixty-seven instances of amphorae depictions, few of them with a base (and some depictions that should be on the list are likewise missing, like the cup from Kassel, discussed below).

Generally speaking, vase painters do not seem to pay much attention to typology. Most images of pointed amphorae cannot be identified with any specific type made in a designated production centre. Rather, a general and undifferentiated pointed amphora is depicted; it is its function that constitutes the significant aspect. In the red-figure vases, many of these images continue to present the amphora in its proper function (Koehler 1986, 58ff);[11] but this phase is also the point at which the iconography of the pointed amphora used for purposes other than its proper function rapidly enters Athenian vase painting. I have noted eighteen instances in which we witness the amphora in its system function i.e. in idiosyncratic usage. These amphorae are apparently empty, almost always depicted in a horizontal or overturned position rather than upright. I will now discuss several representative examples of such usage, which I have organized into categories. These are not absolute, as the interpretations for the items' usage are at times, of necessity, somewhat speculative. We will see that the diverse system-functional usages of the amphora explored below all derive from the affordances inhering in the vessel's formal features: being made of clay, its smooth curves, its tip, the narrow neck, and its size scaled to the user's body.[12]

The first grouping is that of scenes showing amphorae being utilized as substitutes for furniture. An example is found in a scene decorating an Athenian red-figure cup-skyphos attributed to Epiktetos.[13] The vase dates to 510–500 BCE and is housed today in Naples (Fig. 1). On one side, we see a maenad reclining on the ground.[14] In her extended right hand she holds a thyrsus, while in her left hand she holds a kylix. She is approached by an ithyphallic mule. Supporting her back as she reclines is a garlanded pointed amphora positioned on its side. The image is tightly connected to the world of the symposium and of wine consumption (Lissarrague 2013, 90, Fig. 66). Here the amphora is used as a makeshift cushion. A later example is an Athenian red-figure askos housed in Tübingen, dating to ca. 430 BCE (Fig. 2).[15] On one side of the handle, a naked satyr sits on the ground, both hands supporting an upright amphora. On the other side of the handle, a similar satyr leans upon a horizontal amphora. A similar usage is shown in an Athenian red-figure cup attributed to Onesimos, now in Boston.[16] In the tondo, we see a garlanded satyr, frontally positioned with head turned to the right, seated upon a pointed amphora, and balancing himself in that position by means of his feet and hands (Sorabella 2007, 229; Isler-Kerenyi 2015, 53, Figure 26). On the amphora the word kalos is written. We can infer from these scenes that, in the eyes of vase painters, the affordances of the smooth curves of the amphora invite users to lean or sit upon it.

Figure 1: Athenian red-figure skyphos, unattributed, 510–500 BCE.
Naples, Museo Archeologico Nazionale, RP1. Illustration: Efrat Young-Ron.

Figure 2: Athenian red-figure askos, unattributed, ca. 430 BCE.
Tübingen, Eberhard Karls Universität, Archäologisches Institut. Photo: Th. Zachmann.

The second grouping shows amphorae used in play and sport. In the tondo of Athenian bilingual cup attributed to Skythes and dated to 510-500 BCE, we see a naked youth with a wreathed head (Fig. 3).[17] Raising his left leg, on which his himation hangs, he balances a pointed amphora on his left foot, and maintains this challenging pose using his hands to balance himself. Another image presents a further possibility in the use of the amphora as a toy. On a cup attributed to the Epeleios Painter housed in Brussels, we see four youths playing with a pointed amphora (Fig. 4).[18] Two of them are bent over as they lift the vessel, positioned horizontally. Simultaneously, two other youths piggyback upon the first two, spreading their arms wide, with cups held in their left palms. The impression is of "good-humored larking" (Osborne 2018, 171), in which the pointed amphora is a focal point, though the nature of the game is not entirely clear. Perhaps we can interpret in the same spirit the scenes decorating an early Classical skyphos attributed to the Euaion Painter.[19] On one side of the vase, a satyr jumps on a horizontal pointed amphora, while on the other side another satyr throws a boot[20] towards the same amphora. The satyrs seem to be engaged in some game involving the vessel and the boot. Lastly, an Athenian red-figure cup attributed to the Nikosthenes Painter (Fig. 5)[21] presents on one side a group of satyrs mounted upon pointed amphorae, as they navigate the waves of a stormy sea, while on the other side a comparable group of satyrs rides on wine skins. Perhaps they are engaged in some marine sport or marine komos (Brommer 1959, 60; Beck 1975, 37, No. 148; Davies 1978, 78; Kassab 1986, 312, Fig. 7; Lissarrague 1990, 73–4, Fig. 55). Here too, the latent affordances stemming from the formal features and size of the pointed amphora, call for such usages. The pointed tip works well for juggling, while the size of the amphora makes it into a kind of large ball for playing with, jumping on, or even riding on as a make-believe hollow ship.

Figure 3: Athenian bilingual cup attributed to Skythes, 510–500 BCE.
Paris, Musée du Louvre, F129. © 1994 RMN / Hervé Lewandowski.

Figure 4: Athenian red-figure cup attributed to the Epeleios Painter, ca. 500 BCE.
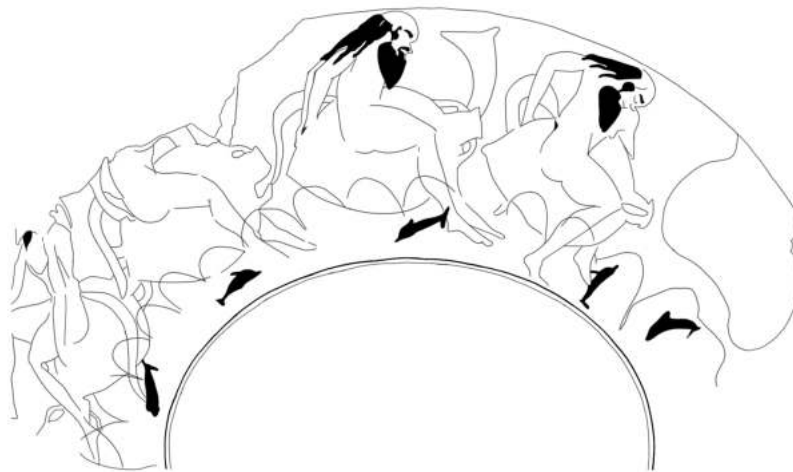Brussels, Musées Royaux A 3407. ©RMAH, Brussels.

Figure 5: Athenian red-figure cup attributed to the Nikosthenes Painter, ca. 500 BCE.
Paris, Musée du Louvre, G92. Illustration: Efrat Young-Ron.

In the third grouping we find several scenes portraying the amphora being beaten, or about to be so. On an Athenian black-figure on white-ground oinochoe attributed to the Athena Painter, we see a scene featuring two satyrs.[22] The one to the right crouches while playing the double flute. The one to the left straddles a horizontally positioned amphora, holding one of its handles in his left hand, while in his raised right he grips a sandal and is most probably about to strike the clay vessel. A drinking horn and a kantharos rest on the ground. The most obvious interpretation of this action is that the satyr is imposing a punishment for some unknown reason (perhaps because the amphora is empty, disappointing his desire to imbibe?). This interpretation is in line with other scenes where the sandal – in another example of non-normative system function – is used as a hitting tool (Manchester 2003, 258, No. 61; Young 2020, 2–3). However, Karen Manchester, in the entry catalogue devoted to this particular vase, raises another possibility: the satyr is using the amphora as a drum to beat out a rhythm for the flutist. Both interpretations are plausible in terms of affordances supporting usage and action. Another scene decorates an Athenian red-figure cup attributed to the Ambrosios Painter (Fig. 6).[23] The cup is dated to 510-500 BCE and is housed today in Boston.

A great deal of attention has been paid by scholars to the tondo, where a unique fishing scene is depicted (e.g. Hölscher 1992; Cohen 2006, 171–172; Filser 2017, 105–106), while the scenes decorating the outer sides are hardly discussed.[24] On both outer sides, we see satyrs in komos, two on each side. On one side, two satyrs dance frenziedly, one of them holding a drinking horn. On the other side, one satyr dances with a kantharos balanced on his erect penis, while the other satyr raises in his left hand a pointed amphora, inverted, with downturned mouth. His right hand grasps an object, most probably a stone, and it appears as if he is about to throw it at the amphora. Alternatively, following Manchester's suggestion in the previous case, perhaps he will use the stone in drumstick fashion, to drum upon the amphora. Precisely which of these two is correct is unclear to us. We can tentatively add to this grouping one final example, which decorates the tondo of an unattributed cup, dating to ca. 490 BCE and today housed in Athens.[25] A partially naked youth with a wreathed head leaps leftwards, his hands stretched forward, while his head faces backwards towards a pointed amphora at which he gazes. With his uplifted left foot he might be beating or drumming on the amphora. The robust clay can endure such beatings, and the affordances stemming from the ovoid and now empty amphora allow it to act like a sound box.

Figure 6: Athenian red-figure cup attributed to the Ambrosios Painter, ca. 500 BCE.
Boston (MA), Museum of Fine Arts, 01.8024. Photograph © 03/2021, Museum of Fine Arts, Boston.

The final group of vases of interest are decorated with scenes where the amphora presents itself as a substitute for a sexual partner – or to phrase it better, as a sex device. One example is to be found decorating the tondo of a red-figure cup signed by Pamphaios as potter, housed in Kassel.[26] A satyr stands holding a pointed amphora. His body is rather contorted: his legs are bent, his torso twists rightwards with his face frontally presented to the viewer, and he lays his head upon the vessel as if listening, with his eyeballs turned downwards in the direction of the amphora. Both hands hug the vessel, giving an impression of intimacy. Most importantly for our purposes, we see that his erect penis has been inserted into the amphora's mouth and neck.[27] A more elaborate scene decorates the side of a cup attributed to Epiktetos, now housed in London (Fig. 7).[28] There we see a komos of seven wreathed satyrs engaged with five garlanded pointed amphorae. They hold, lift, and peer into them. The leftmost satyr inserts his erect phallus into a downturned amphora that he grips with both hands. We may conclude this category with a scene of a hetaira using a pointed amphora for masturbation. It decorates a cup attributed to Oltos, once in Berlin.[29] A completely naked woman, save for a wreath on her head and two bracelets, stands frontally with spread legs, straddling an overturned vertical amphora. She turns her head to the left and holds two pipes, one in each open hand.[30] The tip of the amphora is inserted into her vagina, and she is apparently masturbating – thus the amphora is being used as a sex device. The affordances of the various parts of the vessel – its narrow neck and round, slightly elongated tip, make it an agreeable sex device.

Figure 7: Athenian red-figure cup attributed to Epiktetos, 510–500 BCE.
London, The British Museum, E35. ©The Trustees of the British Museum (CC BY-NC-SA 4.0).

Looking at the scenes presented above, those putting the amphorae to system-functional uses are either members of the Dionysian thiasos, primarily satyrs, or they are humans of inferior social status. These figures are all may be classified, to one degree or another, as a manifestation of 'otherness' within Athenian society (Padgett 2000, 43; Neils 2000, 206, 219–226). The context is the symposium and the komos – the presence of the amphora being in itself an indication of these contexts – and this is hardly surprising, as both spaces were under the influence of the god Dionysos. The wine he provided resulted in a loosening of constraints that allowed the participants to deviate from normative behavior (Lissarrague 1990, 10–11, 68–80; Cohen and Shapiro 2002, 83).

The scenes that have attracted the most attention are those in which satyrs use the amphora as a sex device. They are usually taken as exemplifying the voracity and undiscriminating sexual appetite of satyrs (Cohen and Shapiro 2002, 84–85; Hedreen 2006, 278–279; Coccagna 2011, 109–110; Heinemann 2016, 200–204). Lacking authority over women, they turn to an available object for their erotic satisfaction (Hedreen 2006, 295). The scenes are also frequently perceived as humoristic and as visual puns (Mitchell 2009, 169). The image of the masturbating hetaira is interpreted in the same fashion. Occasionally discussed in relation to the masturbating satyrs, the image is also conceived as exemplifying extreme sexuality

(Peschel 1987, 44, Abb. 19; Kuels 1993, 82; Lavergne 2011, 103–104). Recently, the image was interpreted as a sophisticated visual pun raising a conceptual and visual parallel between body and vase, pointing especially to the human mouth and stomach (Coccagna 2011, 108ff., Fig. 5.1). This line of interpretation pertains also to the scene of the reclining maenad: she is occasionally interpreted as offering wine and sex to the mule (Johns 1982, 111, Fig. 92; Keuls 1993, 165). The youth who balances an amphora on his foot, as well as the other images showing satyrs leaning on, sitting on, or riding amphorae, are all connected to the komos and usually conceived as exemplifying the wild and humoristic behavior of the users.

However, in contrast to the relatively straightforward depiction of the amphora in these two groupings (sex and furniture), the scenes in which we see the amphorae beaten or about to be so raise problems of interpretation, in terms of the nature of the action. As stated above, the satyr who uses a sandal to beat the amphora can be understood either as punishing the amphora or as drumming on it. There is no way to pinpoint decisively which interpretation is correct, although the first interpretation is based on solid iconographic comparisons. Either way, it is clear that what we have here is a system functional usage of the amphora based on its latent affordances.

It is certainly not surprising that the lion's share of what is considered extreme usage of the pointed amphora is found in the case of satyrs. Satyrs are fantastic creatures, liminal in nature, positioned as they are on the boundary between human and beast and thus not subject to strict social norms and conventions (Lissarrague 1990, 13; Padgett 2003, 27–36; Lissarrague 2013, 53–71; Isler-Kerényi 2015, 4–5, 67–68; Osborne 2018, 188–189). Hence, they become an appropriate agent to convey the depictions of various system functional usages of the amphora, those that are seemingly transgressive by nature.

Very few scholars have addressed the issue of such 'unorthodox' usage directly. Lissarrague was one of the first scholars to acknowledge the phenomenon that, much later, was titled 'system function' by Preston – noticing that in the context of symposium and komos, objects can be "removed…from their ordinary role" (Lissarrague 1990: 68. cf. Lissarrague 2013: 83). Alongside the pointed amphora and other ceramic sympotic vases, Lissarrague gave much attention to the system function of the wine skin. This object, like the amphora, is seen being used as a toy, as an object on which to balance oneself, and as a vehicle to be ridden. A few years later, Beth Cohen and Alan Shapiro devoted an article to depictions of what

they termed 'abused' ceramic vases (Cohen and Shapiro 2002). In their article, they analyzed images in which we see youth, prostitutes, adult men, and satyrs 'abusing' these vases by playing with them, using them as containers for human excretion (urine, feces, and vomit), and masturbating with them. More recently, in the context of visual humor and visual puns, Alexandre Mitchell has discussed various images and labeled the vases depicted in them as 'misused' objects (Mitchell 2007, 205–209; Mitchell 2009, 36, 48).

Drawing on the terms presented in the outset, all these images may be classified as presenting the system function of the pointed amphora. Of even greater interest is the fact that the visual images support the notion advanced by Preston, that both the proper and the system function are complementary. It is true that in most cases there is a clear-cut differentiation between the two functions when it comes to the amphora. However, in a few cases we see both functions juxtaposed in the same image. In the energetic komos scene depicted on the cup from London (Fig. 7), perhaps two out of the five amphorae are still full of wine, as can be judged from the way they are vertically positioned and handled. The same pertains also to the images decorating the askos from Tübingen (Figs. 2a, 2b). The upright amphora is most probably full, while the one on which the satyr is leaning on is most probably empty.[31] If this observation is correct, what we have here is a concurrent depiction of both proper and system function of the amphora in the same image. Both functions are represented as complementary and dialectic, even equal.

Conclusions

Most of the representations of system function discussed here are considered by scholars as being products of the vase painters' imaginations (Koehler 1986, 58; Kilmer 1993, 4, 65). Indeed, for several decades it has been acknowledged that the scenes decorating Athenian vases are creative constructs bearing a complex relationship to reality. I do not wish to claim that the iconography of the system function of the pointed amphora reflects actual usage in an absolute sense. My point here is that a close examination points to the fact that the vase painters, when depicting the amphora in its system functional usages, took into consideration the affordances of the amphora, both in term of its material and its

design. The narrow, rigid, tube-like shape of the neck of the amphora lends itself to the insertion of an erect penis; both the rounded tip of the amphora and the possibility of standing it stably on its mouth make it suitable for inserting into a vagina; the curves of its belly make it comfortable to lean on; and clay is a material robust enough to endure sitting, beating, or drumming – this last action being facilitated by one further latent affordance: the ovoid shape of its body, which makes it act like a sound box when empty.

When visualizing the system functional usages of the chosen object, it seems that affordances set the limits of representation. We may cite here Alan Costall, one of Gibson's followers: "…this is the crucial bottom line: although we can do many things with any single thing, we cannot do anything with any thing" (Costall 2012, 89). Vase painters seem to perceive intuitively the affordances of the amphora, perhaps due to their great familiarity with the constant object of their attention: the vase. In the world of vase painting there is no such thing as to 'abuse' or 'misuse' objects, only what it is possible and impossible to do with the object. The frequent selection of the pointed amphora stems perhaps from its availability; it was certainly a mundane and ubiquitous object. Possibly its representation in such diverse usages derives primarily from its being a simple, mobile object, passing from hand to hand and present in ever-changing spaces; conceivably, the very mobility and adaptable nature[32] of the pointed amphora supported or even encouraged its visual flexibility.

The images discussed here mostly decorate sympotic vases and were most probably targeted to a male audience.[33] Although the world of satyrs is fantastic, remote from the world of the participants of the symposium and revelers in the komos, the pointed amphora is not. Always in the sight of the audience, it is part of the here and now, rooted in the real world. Even if the behavior recorded in the images is far beyond the borders of normativity (cf. Osborne 2018, 136, 199) and is intrinsically connected with the Dionysian sphere where it takes place, the images present, at least to some extent, concrete and not unreasonable possibilities for action, as envisioned by vase painters and as consumed by their viewers. The latent affordances of the pointed amphora are brought to the surface and given visual form; a viewer may subsequently decide to follow suit and utilize his own clay vessel in a new fashion. Thus, the visual image may serve not only as a passive reflector of affordances and system functional usages, but also as a generator of them.

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Notes

[1] On the concept see also Costall 1995: 468; Scarantino 2003: 949; Knappett 2004: 44; Costall 2006: 18–26; Glăveanu 2012: 193–194; Costall 2012: 87. For articles dealing with the history of the concept and its main tenets see Dotov et al. 2012; Osiurak et al. 2017.

[2] For the purposes of the discussion here I address humans, but we should recall that, in his approach, Gibson intended to address all organisms.

[3] One of the greatest contributors to this process was the American designer, researcher, and author Donald A. Norman. In his book *The Design of Everyday Things* (2013) he discussed the term specifically in relation to human-made objects. For the differences between Gibson's affordances and Norman's affordances, see McGrenere and Ho 2000: 179–182.

[4] A comparable model for dealing with the usage and function of objects is the 'artifact life cycle' model, developed by Michael Schiffer almost fifty years ago (1972, 157–160), and much later adapted and modified by Theodore J. Peña in relation to the life cycle of Roman ceramic vases (Peña 2007, 6–16). The life-cycle terms that correspond to those being applied here are 'prime use', corresponding proper function, and 'reuse type B' (Peña 2007, 10), corresponding system function. Mark L. Lawall (2011) has already applied the model to Greek amphorae, noting the common practice of reusing pointed amphorae (cf. Lawall 2000).

[5] Cf. Keane 2014: S315–S316, who also uses the example of the chair to elucidate the nature of affordances.

[6] The bibliography on transport amphorae is vast. To mention only two of many works, we have the basic book on the topic by Virginia Grace, published in 1979; and a recent anthology on the subject edited by Sarah Japp and colleagues (2018).

[7] The phenomenon of reusing amphorae is attested to in Herodotus' *Histories* 3.6, 8.28. On a scene decorating a red-figure lekythos housed in Karlsruhe (Badisches Landesmuseum, B39. *BAPD* 361), attributed to the manner of Meidias Painter and dating to ca. 400 BCE, we see a woman (Aphrodite?) standing on a ladder and ready to receive from Eros an upended broken amphora, from which sprouts visibly emerge. The usage of a broken amphora as a flowerpot corresponds to Penã's 'reuse Type C', that is to say, "Reuse involving an application different from the vessel's prime-use application involving physical modification" (Peña 2007, 10). See also Abdelhamid 2013.

[8] For example: black-figure amphora, Brussels, Musees Royaux, R279. *BAPD* (=Beazley Archive Pottery Database. http://www.beazley.ox.ac.uk/index.htm) 320419.

[9] For example: black-figure lekythos, Paris, Musée Auguste Rodin, 734. *BAPD* 302335.

[10] For example: Würzburg, Universität, Martin von Wagner Mus., HA115. *BAPD* 4248.

[11] Several more articles focus specifically on the iconography of the pointed amphora, mainly in its proper function. One is by A. Chatzidimitriou (2010), discussing images dating from the Geometric to the Classical periods. Another is by C. Vandermersch (1997), focusing on South Italian and Sicilian vases dating to the fourth century BCE. Vandermersch is concerned mostly about the issue of typology of the depicted amphorae. We may also mention the article by John Lund (2011), focusing on the handling of the amphora in the Roman period, based on iconographic evidence. Adapting Penã's life cycle model mentioned above (note 4), he briefly addresses aspect of the reuse of the amphora as attested in visual images.

[12] For the most updated discussion of the material properties of actual amphoras in relation to their function and usage, see Hein and Kilikoglou 2020.

[13] Naples, Museo Archeologico Nazionale, 27669. *ARV* 50.71; *ARV²* 77.85; *Add²* 168; *BAPD* 200612. From Anzi, Italy.

[14] By contrast, Keuls (1993, 165, Fig. 139) identifies the woman as a hetaira. On the conflation between the iconography of the hetaira and the maenad, see Moraw 1998, 119, 162, 227; Neils 2000, 219ff.; Villanueva-Puig 2009, 73.

[15] Tübingen, Eberhard-Karls-Univ., Arch. Inst., S1700. *BAPD* 16838.

[16] Boston (MA), Museum of Fine Arts, 10.179. *ARV* 212.1; *ARV²* 327.110, 1592, 1567; *Para* 359; *Add* 108; *Add²* 216; *BAPD* 203364. From Orvieto, Italy. Website: https://collections.mfa.org/objects/153725/drinking-cup-kylix?ctx=757d4f2d-efad-4d78-9548-72fa3a601d6b&idx=4

[17] Paris, Musée du Louvre, F129. *ARV* 75.19; *ARV²* 84.20, 1578.11; *Add* 84; *Add²* 170; *BAPD* 200430. Website: https://www.louvre.fr/en/oeuvre-notices/attic-type-b-bilingual-vessel

[18] Brussels, Musées Royaux A 3407. *ARV* 108.5; *ARV²* 146.7; *BAPD* 201295. From Vulci, Italy.

[19] Havana, Museo Nacional de Bellas Artes, 159. *BAPD* 14585.

[20] Olmos (1993, 162, No. 70) identifies the object as a drinking horn.

[21] Paris, Musée du Louvre, G92. *ARV* 105.2; *ARV²* 134.3; *Add* 88; *Add²* 177; *BAPD* 201118.

[22] Private collection. *BAPD* 9029558.

[23] Boston (MA), Museum of Fine Arts, 01.8024. *ARV* 71.5; *ARV²* 173.9; *Add* 92; *Add²* 184; *BAPD* 201573. From Orvieto, Italy. Website: https://collections.mfa.org/objects/153702/drinking-cup-kylix?ctx=90a19697-dc61-4507-8955-fa8b2a941eff&idx=0

[24] Hölscher (1992: 211) is one of the very few scholars who mention the outer sides of the cup, and even she does not relate to the object held by the satyr and the action he performs.

[25] Athens, National Museum, 1431. *BAPD* 14265. From Corinth, Greece. Photo: *CVA, Athens National Museum* 1, Pl. 3.5-6.

[26] Kassel, Antikensammlung, ALG214. *BAPD* 14933. Website: https://datenbank.museum-kassel.de/25161/0/0/0/s1/0/100/objekt.html.

[27] There are two additional such scenes: a fragmentary bilingual cup attributed to Skythes, now in Palermo (Museo Archeologico Regionale, *BAPD* 200431) and an amphora, housed in the Paris (Musée du Louvre, CP11072, *BAPD* 200148), 1478.

[28] London, British Museum, E35. *ARV* 47.36; *ARV²* 74.38; *Add²* 170; *BAPD* 200482. From Vulci, Italy. Website: https://www.britishmuseum.org/collection/object/G_1836-0224-88

[29] Berlin, Lost. *ARV* 42.98; *ARV²* 66.121; *Add²* 166; *BAPD* 200559. From Vulci, Italy.

[30] Kilmer (1993, 65) suggests that she may be a maenad, taking this scene to be the counterpart of the masturbating satyrs.

[31] On the careful planning of the images that appear on askoi, see Hoffmann 1977, 1–10. The discussed askos is absent from Hoffmann's catalogue.

[32] Cf. Carl Knappett's response to Andrew Bevan (Bevan 2014, 407).

[33] However, we cannot rule out the possibility that members of other social groups (women of various statuses, children, and slaves) also handled these vases, or at least had the opportunity to view the images decorating them. Certainly, many of them had also access to pointed amphorae themselves.

Taking Mirrors as Mirrors in Greek Archaeology

Nikolaus Dietrich

Abstract

With Eduard Gerhard's *Etruskische Spiegel* (1843–1897), bronze mirrors come to be among the earliest classes of objects to have been published in a systematic and extensively illustrated corpus within (classical) archaeology in the mid-nineteenth century. By making available archaeological material to scholars who had hitherto based their knowledge of ancient cultures mainly on written sources, such illustrated corpora constitute a kind of 'material turn' *avant la lettre* within classical scholarship. At the same time, however, these same corpora also initiated a process of de-materialisation of their objects: by substituting them for two-dimensional depictions, they often focused exclusively on areas with pictorial decoration, thereby turning functional material objects into sources for ancient art history. In a first part of this paper, I would like to follow these inherent dialectics in the publication of archaeological material by examining the example of bronze mirrors. In a second part, which is focused mainly on a mid-fifth century BC Greek caryatid mirror in New York (Metropolitan Museum of Art 1972.118.78), I try to 'restore' to these Greek mirrors the material aspects that were neglected in past scholarship, using these sophisticated instruments of female cosmetics mainly as sources for the reconstruction of the history of Greek sculpture. Without forgetting the place of mirrors in Greek literature and philosophy, the discussion shall focus on the material affordances of mirrors, and above all their power of reflection and ability to *produce* an image. The (syn-) aesthetic experience of seeing oneself, put back on centre-stage, will thereby shed new light on those mostly erotic iconographies with which mirrors were adorned.

Introduction

Material-Based Archaeology and the Discipline's Dialectical Progress Towards Dematerialisation

Archaeology is the discipline which is engaged with the study of the material remains of past cultures. For this simple reason, there was in principle no need in this field for any material turn in order to posit material objects as the starting point for thinking about culture. We may therefore say that the progressive rise of archaeology as an intellectual endeavour from the eighteenth century onwards until its establishment as an academic discipline in the later nineteenth century[1] itself marked a kind of material turn within the humanities. However, to present the rise of archaeology solely as a story of emancipation for material things from the guidance of texts as the most trusted bearer of meaningful discourse on past cultures would tell only one side of the story. As I would like to show in the first step of this discussion, the systematisation and professionalisation of archaeology as an academic discipline in the course of the nineteenth and much of the twentieth century not only assigned intellectual value to things, but also brought about, perhaps as a necessary side-effect, what may be called a dematerialisation of its objects. This dialectical progress of the material-based hermeneutics of archaeology towards the dematerialisation of its approach was fuelled especially by what may be thought of as the most basic and fundamental task that this new discipline had to undertake in its scholarly development: the task of publishing its materials.[2] Bronze mirrors provide a perfect example of these dynamics. Already Eduard Gerhard, who was responsible for the Berlin *Altes Museum* and who is known as one of the 'founding heroes' of archaeology, initiated the systematic collection and publication of all known Etruscan bronze mirrors in a five-volume corpus entitled *Etruskische Spiegel*,[3] with the first volume being published in 1843. Arguably, what mattered most for all those involved in this large-scale publication project (and even more for its later users!) was not the accompanying texts – although their editions stood at the height of contemporary scholarship – but the plates. It is the illustrations in simple but clear engravings, such as that of plate 121 (to choose but as a random example; fig. 1) that make each of these physical objects bound to the place where they are kept available to the scholar's eye wherever s/he is. It is the 'transportable' form of the engravings that allows them to be paired with any other object in the trial-and-error game of comparison, which arguably constitutes the most important method of archaeology. Even, if from the perspective of intellectual history, the 'invention of archaeology' may still be credited to the eighteenth-century neo-classicist Johann Joachim Winckelmann – from the perspective of material culture, it is the proliferation of systematised image-corpora such as Gerhard's *Etruskische Spiegel* in the nineteenth century that laid the foundations of archaeology as a method of cultural analysis.

Figure 1: Plate 121 from Eduard Gerhard's corpus of Etruscan mirrors (second volume from 1845). By showing the fleeing Perseus after his decapitation of Medusa, the monster whose sight turns the viewer into stone, this image engraved on the mirror's back has much to do with vision. Repro from Gerhard 1845. Universitätsbibliothek Heidelberg/C 5638 Folio: 2/Plate 121

Yet the role of illustrations in integrating material culture into scholarly debates was nevertheless ambivalent. Indeed, the engravings published by Gerhard in his compendium might have made Etruscan mirrors available to the scholar's eye, but at the same time they largely reduced these material objects to the status of merely *visual* artefacts. As Gerhard himself owned several of the published mirrors in his private collection, he was able to experience these objects in various ways. He could hold them in his hands, feel their weight (which must have greatly exceeded that of a modern hand-mirror!) and their 'cold' metallic materiality, and detect the engraved image through close scrutiny (which must have been much harder to see than on the clear linear illustration). Aware of its old age, he would handle the item in question with care. His relation to the object would thus have been a much more broadly embodied one, if compared to the clean visual relation between the published illustration and the scholar's eye. Once translated into an engraved illustration, the bronze mirror has turned into a flat linear drawing, with only the shadowed depiction of its handle retaining some of the object's three-dimensionality. In this way materiality no longer interferes in the scholar's relation to his/her object of interest, we may say, and therefore the path is cleared for the material object to enter and potentially revive a hitherto logocentric scholarly discourse.

The exclusivity of the private owner's relation to the objects in his/her collection – as opposed to the published objects in the typological catalogue, which we may take as a wholly new kind of collection – is clearly elitist in nature. But there are also scholarly arguments against any nostalgic longing for restoring this intimate object-relation of pre-academic archaeology. Indeed, the private owner's more plurisensorial experience would not necessarily bring him/her closer to an ancient experience of the bronze mirror, most of all because the object's main function of serving as a mirror is irretrievably lost. So let us instead accept the dialectics of scientific progress and look for other ways to come to terms with ancient mirrors *as mirrors* (in this case).

Publishing Ancient Mirrors: Turning Things into Sources

To start frankly: if what we see on fig. 1 is not a mirror, what is it instead? To stress the fact that it has become a mere linear drawing on paper is equivalent to treading the thin line between a deep insight and a straightforward banality. In order to leave this dangerous path, I may correct myself a little. What fig. 1 illustrates is indeed a mirror, but instead of showing its front side with its – no longer functional – mirroring surface, it shows its *backside*. Here, as in many other (though by far not all!) cases, this backside is decorated with an engraved image. Since ancient art history was the primary focus of archaeology in the nineteenth century, it was such image-bearing backsides that made bronze mirrors an interesting category of objects for the archaeologists' study.[4] By showing the object's image-bearing backside and making it the front side to the scholar's eye, the illustration turns a mirror into a source for the study of ancient art history.

As justified as this may be when measured by nineteenth-century research agendas, this operation amounts to a phenomenal disempowerment of the very special, and indeed somewhat magical object, of the 'mirror'. By its capacity to produce an image, a mirror is the prototype of an object with proper agency. It is not only the passive object of another's activities, but within these activities it is itself an agent: whenever someone looks into the mirror, the mirror looks back. The relation to one's own mirror is thus reciprocal. Often, the image offered by the mirror does not obey the viewer's desires and gives answers that are hard to accept. The evil queen from Snow White knows this from painful experience, and so do we all.

A mirror may primarily serve cosmetic ends as an instrument for its owner's efforts to enhance or restore one's beautiful and desirable appearance. However, it sometimes defies such an instrumental use by telling the ugly truth instead of serving the beautiful façade. This is what eventually made the famous courtesan Laïs decide to get rid of her mirror and give it to Aphrodite as a votive offering, once age had destroyed her beauty. This, at least, is the fantasy described in an epigram from the *Anthologia Graeca*[5], which mimics a votive inscription on this very object:

> Laïs, her loveliness laid low by time, hates whatever witnesses to her wrinkled age. Therefore, detesting the cruel evidence of her mirror, she dedicates it to the queen of her former glory. 'Receive, Cytherea [= Aphrodite], the circle, the companion of youth, since thy beauty dreads not time'. (*Anthologia Graeca* VI 18, translated by W. R. Paton)[6]

For modern archaeologists continuing Gerhard's project, the images with which a mirror may be decorated make them interesting. Unsurprisingly, ancient epigrammatists such as the author of this would-be votive inscription rather focus on the image produced by the mirror within the face-to-face engagement with its owner. While the beauty of the decorated mirror is as eternal as that of Aphrodite herself, the beauty reflected on the mirror fades away when its owner grows old. As long as the ephemeral beauty reflected by the mirror still matches the precious object's own lasting beauty, the relationship of Laïs and her mirror is akin to a friendship. Indeed, she calls it the 'companion of her youth' (νεότητος ἑταῖρον). Yet once age has disrupted this perfect match of Aphrodisian beauty between both the mirror and its owner's face, this friendship turns into hatred, and the mirror reverts, as a votive offering, to the ownership of the eternally beautiful Aphrodite who initially made Laïs the gift of beauty. In this epigram's story of disrupted friendship between Laïs and her mirror, the object is granted the status of a person. Both the initial friendship and the present hatred between the two attest to the intimacy which prevails in this face-to-face relationship.

The French scholar Françoise Frontisi-Ducroux took this epigram as the starting point of her wonderfully rich and insightful study of the anthropology of mirrors in ancient Greece from 1997.[7] For her interpretative efforts, both Greek literature and philosophy, in which the mirror (in Greek mostly designated as κατόπτρον: 'the thing to be looked upon') proves to have an astonishingly wide metaphorical potential, and Greek painted vases with images of women handling mirrors were of great use. By contrast, the very numerous 'real' Greek bronze mirrors themselves had much less to offer for her specific interests. An archaeologist such as myself may well deplore this apparent uselessness of archaeological finds of 'real' mirrors for understanding the mirror's cultural entanglement as a practical tool in Greek life and as a metaphorical tool in Greek thinking. But we have to admit that this is consistent with the way in which the process of systematic publication and illustration of ancient mirrors since Gerhard has turned them into de-materialised image-bearers, which function ideally as sources for ancient art history, but which are divested of their – concrete and metaphorical – powers of reflection.[8]

Mirrors as Mirrors: Reinstating the Affordances of Things

As already said, over time ancient bronze mirrors lost their (concrete) powers of reflection long before archaeologists started to collect them. This holds true even for the most well-preserved Greek bronze mirrors, such as a mid-fifth century BC exemplar from the New York Metropolitan Museum (fig. 2).[9]

Figure 2: Greek bronze mirror on a caryatid stand, mid-fifth century BC. New York, Metropolitan Museum 1972.118.78. Licensed under CC0 1.0 Universal (CC0 1.0) Public Domain Dedication.

Accordingly, any attempt to re-evaluate mirrors as mirrors inevitably starts with a failure: we are not able to reproduce the ancient experience of the mirror simply by looking on its bronze surface, since we have been deprived of the high polish which was responsible for the mirroring effect. Reinstating the affordances of this mirror, which shall serve as a case-study for the remainder of this chapter, is therefore a speculative exercise. But even if we were able, through the approximations of experimental archaeology, to look at this mirror in its still reflecting state, this would not really solve our problem. Indeed, as an interaction of a (wo)man[10] and a material object, the ancient experience of the mirror is forged not only by the crafted object itself, but also by the viewer's eyes[11] and all which made them what they were: a certain visual culture, ancient patterns of behaviour, the social context of cosmetics, and the cultural semantics of seeing oneself. In focussing on the bronze mirror alone, we take our cue from nothing more than a small material fragment of a complex network of humans and things. The fact that it does not return the gaze anymore is therefore only a memento of this fundamentally fragmentary nature of our knowledge.

Let us therefore concentrate on what this no longer reflecting mirror still discloses of its former state as a functional object. With a total height of about 40 cm, a quite considerable weight of 0,9 kg and a stable three-legged base, this exemplar was presumably made to be positioned on some flat support such as a table. These basic material characteristics already give us a clear indication of its main context of use. Although the owner may well use the mirror's caryatid stand as a handle and hold it in her hands while beholding herself, it lacks the mobility of a modern pocket mirror. This restricts it to mainly domestic use. As a precious object, this mirror testifies to the owner's wealth, as would the jewellery with which she would adorn herself in front of the mirror. But while jewellery and precious clothes would magnify her appearance in the eyes of *others*, the mirror would not leave the private realm. In contrast with other luxury goods, this mirror as a sign of wealth is not oriented towards the outside and the public: it rather serves as an instrument of self-identification.[12]

As heavy as this mirror might be, its rich decorative design rather emphasizes lightness. With a siren sitting on top and two 'loves' (*erotes*) flying around the bottom, the mirroring disc is encompassed by winged, weightless figures. On both sides, a dog is chasing a hare around its perimeter, and speed in Greek thinking is associated with lightness. In significant contrast to the modern sprinter packed with heavy muscles, Homer speaks of 'light-footed Achilles' when relating to the incredible speed of this hero. By means of a supporting cradle composed

of slender palmettes and floral tendrils, the mirroring disc is attached to the head of a female caryatid figure shown in a relaxed stance. She does not seem to carry any burdens. The bronze disc is rather floating over her head. Materially speaking, this heavy mirror is not very nimble, but its decorative design fosters other ideas, and the countless images of women's toilette that we find on Greek painted vases treat mirrors as light objects that may easily be held in one hand.[13] This discrepancy between the mirror as a material object, on the one hand, and the mirror as it is conceived in its aesthetic design and as it is – literally and metaphorically – imagined on painted vases, on the other hand, is telling of its intrinsic ambiguity as a cultural object. As a female object, the mirror is bound up with the interior space and immobility. As an instrument of beauty serving the ends of Aphrodite, the mirror is light. The desire it helps to inspire cannot be withheld within closed boundaries, in a like manner to winged Eros.

To explore this heavily gendered object further, and in particular to obtain an idea of the experience which these (no longer mirroring) Greek mirrors may have afforded, it is worth looking to the other side of the gender opposition. As Frontisi-Ducroux has shown, there is a widespread moral ideal which holds that men ought to not reflect themselves in the gaze returned by the mirror, but rather in the gaze returned by other men.[14] We might put this in the following way: whereas the mirror, an object used in the private realm of the house, is the proper 'medium of self-reflection' for women, men shall learn to know themselves through confrontation with their male counterparts in the public sphere. However, unlike the modern concept of the public as an anonymous mass, the public of the small world of the Greek city-state (*polis*) is conceived as a network of personal relations between individuals. Or, as Aristotle puts it: friendship holds together the political community.[15] The idea that men shall function as one another's mirrors in their personal interactions can even take a strikingly intimate character. In Plato's *Alcibiades*, Socrates guides his interlocutor's attention to the phenomenon that on looking closely into the eyes of another person, you would recognise your own reflection.[16] Another passage in Plato imagines this mirroring situation as a face-to-face between (homoerotic) lovers.[17] The beloved boy's eye as the 'perfect mirror' builds on reciprocity and on a loving gaze. In this ideal setting, the eye is both what sees and what returns the gaze, or, put differently: there is a perfect match between how your lover sees you and how you see yourself.

This ideal 'mirroring setting' is a same-sex setting, and it is a male setting. The 'mirroring setting' that we adduced between our exemplary bronze mirror (when it still 'worked') and its owner is obviously a same-sex setting too, but it is a female setting, and, more importantly, it does not involve two human beings but a woman and an object. As we shall see in the following, there is a striking degree of similarity despite this seemingly unavoidable difference. The modern mind tends to see a categorical difference in ontological status between a wo/man and an object. But the Greeks may have drawn more fluid borders between them, at least when dealing with an object which was capable of such far-reaching embodiment as a mirror.[18]

What are these similarities? In a face-to-face exchange with the mirror, the reciprocity is just as perfect as in Plato's setting of two lovers. As we all know from our own experience, looking at oneself in the mirror inextricably means being looked at by the figure 'in' the mirror. In the case of our Greek mirror, however, the effect of reciprocity must have been stronger in at least two respects: the polished bronze disc's form and size concentrate the gaze on the sole face, and its lesser reflecting power calls for a still 'deeper' gaze. The experience that our bronze mirror would have afforded is that of a rather close and intense face-to-face encounter, in which there is not much room left for the surrounding world to enter the picture. This again recalls the face-to-face exchange of lovers. However, to project intimacy into the relation with one's bronze mirror may seem excessive. But we may take the above-cited fictive votive epigram as a witness that such emotional loading of a woman-object relation finds its counterpart in the Greek cultural imagination. The story of love turned into hate between Laïs and her mirror clearly conceives this relation as an intimate one.

The wide spectrum of metaphorical uses of the mirror that we find in Greek language and literature[19] hints at the extent to which the Greeks assigned to mirrors qualities that largely transcend the passivity of an object and sometimes come close to personhood. In a fragment of the Archaic poet Alcaeus, we are told that "wine is for men a mirror"[20], with a sense similar to the famous expression *in vino veritas*. Already in this comparison to the 'active substance' wine, the mirror is conceived as a more than passive object. It is something that has the peculiar power of making apparent things that are otherwise invisible. As an important contextual remark, we might add here that one's own appearance used to be much closer to the category of the invisible than it is in today's culture, with selfies available in every cell-phone and mirrors in every bathroom. When the early Classical poet Pindar calls poetry a mirror of great deeds,[21] this metaphorical use relies again on the mirror's power of making reality apparent. In the erotic novel *Leucippe and Clitophon* by the Imperial Age Greek author Achilles Tatius, the

mirror metaphors are particularly numerous. The clothes of the beautiful Europa, although covering her, are called "the mirror of the body", meaning that they make the covered/invisible body apparent and palpable as a mirror would.[22] But the metaphor of the mirror expands to mental matters too, e.g. in saying that the face is addressed as the "mirror of the mind".[23] Even the soul itself – the property of living beings, as opposed to dead matter – is addressed as a mirror in which (bodily) beauty seen through the eyes is impressed.[24]

The metaphorical potential inherent in the mirror as a material object in Greek literature is thus prodigious. For example, in the case of Achilles Tatius' novel, the metaphor of the mirror proves particularly effective when it comes to eroticism. The same may be said of Greek mirrors as material objects such as the one shown in fig. 2. Whereas mirrors found in, for instance, the elevators of modern office buildings have the primary function for those on their way to a business meeting to ensure one's *correct* appearance, this mirror as an instrument of bodily self-care serves one's *desirable* appearance. Its decorative apparatus leaves no doubts. The flying *erotes* are a case in point here, but they are not alone in pointing towards desire. The siren sitting on top of the disc alludes to those mythical 'monsters' from the *Odyssey* that exercise an irresistible attraction to all (male) sailors passing by.[25] The dogs pursuing hares around the disc from both sides also point in the same direction. Indeed, the hare hunt is a common pictorial metaphor of erotic pursuit in the imagery of that time.[26]

But who is the caryatid figure who supports the mirror? There has been quite a lot of discussion in previous scholarship of the identity of these female figures which we find in almost all mirrors of this type.[27] Given the two *erotes* flying around her head, most scholars regarded the figure as Aphrodite herself. This would of course fit the mirror's general focus on eroticism. But it fails to acknowledge one basic fact, namely that this figure is a mere subsidiary piece of decoration in the design of such mirrors: a somehow insulting position assigned to the venerable goddess of beauty and sex! Moreover, this misreading (as I think) is symptomatic of a misconception in previous scholarship that bronze mirrors are mere sources for Greek art-history, or, more specifically, for Greek statuary as the most esteemed genre of Classical art. Indeed, many studies of the category of so-called caryatid mirrors used these tiny artefacts as a kind of substitute for those Classical bronze statues which are praised in ancient literature (e.g. by Pliny the Elder and others) and later in Winckelmann-inspired art-historical literature, but which are almost inexistent in our material record.[28] By including such bronze mirrors in the grand history of Greek sculpture, the scholarly tradition has moved their centre-piece – the mirroring disc – to the periphery. The mirrors became blind, and accordingly, assigning to their anthropomorphic handles the divine identity of Aphrodite seemed a reasonable proposition for something as venerable as Greek statuary.

But the mirror is not (or better: was not) blind. Therefore, we have to take the reflected face of its (female) user as the most prominent image that our caryatid mirror presented to the viewer. The caryatid needs to step back to the second line, together with the other pieces of figurative decoration mentioned above. However, this does not resolve the question of whom these female caryatid figures may have represented. Strictly from the point of view of iconography, this question has to remain open. Indeed, in Greek images of the period, *erotes* may surround any kind of desirable female figure, either divine or human. Nor does the attribute of a bird provide any definite clue for determining her identity.[29] The way she holds it in her outstretched right arm is reminiscent of the numerous archaic statues of young maidens set up on graves or (more frequently) as votives in sanctuaries. These so-called *korai* are well-known for their steady resistance to any attempt to assign them a definite identity. In their graceful and smiling address to the viewer, by presenting some meaningful object (alias attribute) in their outstretched arm, they mimic an exchange of gazes and gifts and oscillate between the divine identity of the goddess in the sanctuary and the human identity of a charming young maid. These *korai* hold both parties of the votive gift in balance: the divine side of the receiving goddess and the human side of the offering individual. Identity is here a matter of the viewer's projection rather than one of iconographic definition.[30]

The same logic of open identity, which is ready to receive, by way of projection, either the divine identity of Aphrodite herself or the identity of a mortal woman blessed with Aphrodisian charms, applies, I suggest, to our caryatid figure, too. In the mirroring situation with its exchange of gazes between the woman and herself, one projected identification of the caryatid figure strongly suggests itself. The woman cultivating her own desirability in front of the mirror may simply recognise herself in the attire of Aphrodite. Within the large spectrum of specified identities which lie within the affordances of the caryatid figure's un-specific iconography, the options 'the mirror-owner herself' and 'Aphrodite' seem diametrically opposed to one another, but they might be easy to reconcile. Indeed, cultivating and experiencing one's own Aphrodite-like desirability in the face-to-face exchange with the mirror is *being* Aphrodite, at least for that short-lived moment. Not the Aphrodisian desirability itself but its ephemeral possession by women who do not enjoy divine immortality draws the non-transgressible line between the human and the divine domains.

Here, it is useful to recall the short epigram on Laïs' mirror, the courtesan whose once divine beauty faded away. From the moment when she was no longer able to reproduce the experience of enjoying her own Aphrodisian desirability, she began to resent her mirror. But before, it was love! In the Greek cultural imagination of which both this epigram and our material bronze mirror are an offspring, the mirroring situation is conceived as a pleasurable one. This cosmetic self-care in front of the mirror involves, of course, the sense of vision. But it involves other senses too. Obviously, smell is activated in connection with perfuming one's own body. A similar caryatid mirror conserved in the Louvre was found even with a perfume flask attached to it with a chain.[31] The figure of the siren participating through her frontal pose in the face-to-face exchange between woman and mirror also incorporates, by her mythical reference to the irresistible beauty of her singing, an auditory element as another important component of desire. Finally, cosmetic self-care in front of the mirror goes together not only with touching one's own physical body, but also with handling the beautiful, heavy yet fragile, bronze artefact. One part of it was apt to be taken in one's hands, namely the caryatid figure that also functions as a handle. Of all pieces of figural decoration encompassing the mirror disc, this image-body is also the one most suitable to receive the projection of one's own identity.

Of course, the joyful experience of one's own desirability, which the mirror may provide to its owner in a multisensory way, is ultimately meant to culminate in an erotic interaction outside this closed circuit, whether imagined or real. As it has already become clear, Greek mirrors are an instrument of gender segregation to an extent that is hard for the modern mind to accept: a man with a mirror is an effeminate, as we learn from the comedies of Aristophanes![32] However, a fundamental discontinuity between ancient and modern ideas on gender is in any case what we would have expected. Yet the notion that Greek mirrors are also (what we would call) 'sex-positive' to an extent that would create some discomfort even to the most neutral of modern commentators is a much greater surprise. For any liberal mind, the problem would not start with such explicit depictions of sexual interaction as we find on an infamous box-mirror in Boston (fig. 3a).[33] It is not representative of the overall standard for the decoration of this new type of precious bronze mirrors that appear in late Classical times and replace the older type of caryatid mirrors. Most common for the relief decoration of the boxes in which the mirroring discs are kept continue to be images of Aphrodite and other desirable women.

Figure 3a: Lid of a Greek box-mirror with a copulating couple being crowned by Eros, around 340–320 BC. Boston, Museum of Fine Arts RES.08.32c.2. © Museum of Fine Arts, Boston.

But the copulating couple who is crowned by Aphrodite's messenger (*eros*) for their beautiful worship of the goddess of love only spells out what the more standard imagery of mirror boxes would have alluded to in less explicit ways. In opening up the box, the mirror on the reverse side of this relief would appear side-by-side with an even more explicit engraved image of sexual intercourse (fig. 3b), which is focused on a more specific moment (the penetration) rather than the timeless happiness which features on the boxes outside. In contrast to the calm woman, who seems to have things under control, the appearance of the man's agitation characterises him as overwhelmed by desire: a state which would earn him moral criticism from the philosophers who preach equanimity. If she was able to awaken such desire, then her mission is accomplished, she has won, and the mirror as her partner in cosmetic self-care has demonstrated its due service.
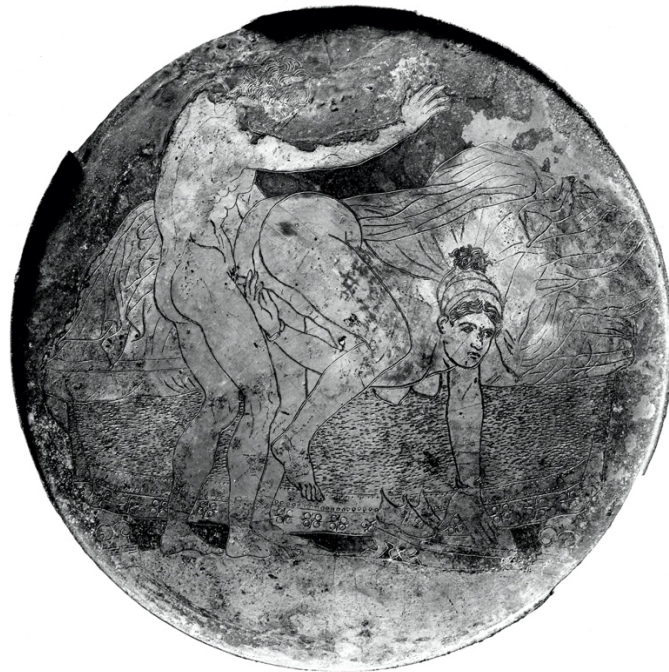
Figure 3b: Engraved image from the inside of the same box mirror.
On opening the box, this image would appear side-by-side
with the actual mirroring disc.

This same logic which regards the mirror as an effective instrument for awakening irresistible desire is at work in another, this time fairly frequent, subject-matter for the figural decoration of mirror boxes: the rape of Auge by the drunken Herakles (fig. 4).[34] As in the previous picture of love-making, in which the man is quite driven by his erotic desire, Herakles is overpowered by wine and sexual lust. He gives a bad example of a lack of self-control, signalling the victory of female attraction over Herculean strength, even if the raped Auge ends up being the victim of her own victory. As a decoration of the lid that is visible only when the box is closed, it mirrors (in the Greek metaphorical sense of 'making visible') the effectiveness of the polished bronze disc which is still concealed in the box and thereby participates in the mirroring action of that key object in the women's powerful arsenal. Or, to put the point differently, in order to tease out the inherent ambivalence: the image of a rape was apparently seen as a suitable decorative addition to an object of female erotic self-empowerment. At this point, Greek bronze mirrors' radical 'sex-positivity' *does* start to create discomfort.[35]

Figure 4: Lid of a Greek box-mirror, decorated with a relief picture of the rape of the priestess Auge by the drunken Herakles, around 330 BC. Athens, National Museum St. 312. Photo by George E. Koronaios. Licensed under CC BY-SA 4.0, via Wikimedia Commons.

Let us end our discussion which is about to take a more closely iconographic turn, at this non-conclusive point. Whatever direction a further exploration of the pictorial decoration of Greek mirrors should take, the next step ought to be to return to those corpora that put together and make available our accumulated knowledge of this material. However, the de-materialising dynamics of such archaeological publications should be countered by re-centralizing the mirror and the experience that it affords. In this way one may (hopefully) enter the Hegelian 'synthesis phase' within the dialectical progress of archaeological research.[36]

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Notes

[1] On the history of archaeology, Schnapp 1993 is still fundamental.

[2] On the history of illustrated publications of archaeological material in nineteenth century, see recently Lehoux 2018.

[3] An open access digitisation of this five-volume corpus issued in 1843, 1845, 1863, 1867 and 1897 has been produced by the Heidelberg University library:
 https://digi.ub.uni-heidelberg.de/diglit/gerhard1843bd1/0109;
 https://digi.ub.uni-heidelberg.de/diglit/gerhard1845bd2/0016;
 https://digi.ub.uni-heidelberg.de/diglit/gerhard1863bd3;
 https://digi.ub.uni-heidelberg.de/diglit/gerhard1867bd4;
 https://digi.ub.uni-heidelberg.de/diglit/gerhard1897bd5 (accessed January 29, 2021).

[4] Not surprisingly, Gerhard's corpus collected and depicted only those mirrors that had an engraved image on their back.

[5] The *Anthologia Greca* is a collection of epigrams dating back to Byzantine times. The present epigram is also already of post-antique date, but neatly follows an ancient tradition. The epigram is an important genre of short poems in Greek literature. The epigram (*epi-gramma* = something 'written on') often plays with the idea of being written on an object, as for example a statue or a votive offering of any kind. Such votive epigrams have been compiled in book VI of the *Anthologia Graeca*. While most of the epigrams in this anthology only build on the fiction of being inscribed on the respective object, some likely copy real statue epigrams. The epigram cited above by the sixth century AD epigrammatist Julian of Egypt is known to belong to the former category.

[6] Several other epigrams from the *Anthologia Graeca* deal with the mirror of Laïs and reiterate similar themes. On the series of Laïs-and-her-mirror epigrams, see e.g. Ypsilanti 2006.

[7] F. Frontisi-Ducroux in Frontisi-Ducroux and Vernant 1997, 51–250.

[8] For Etruscan mirrors, Gerhard's pioneering corpus is being renewed by the much more large-scale international corpus-project *corpus speculorum etruscorum*, with volumes published from the early 1980s until the present. Concerning the Greek material, the two major types of image-bearing mirrors, namely caryatid mirrors (see fig. 2) from the archaic and early Classical period and later box mirrors (see fig. 3 and 4) from the late Classical and Hellenistic periods, have been published in catalogue-like monographs by, respectively, Lenore Congdon (Congdon 1981) and Agnes Schwarzmaier (Schwarzmaier 1997, replacing the older Züchner 1942). Both monographs focus primarily on the images which decorate those mirrors, and attempt at the regional and chronological ordering of the material. In doing so, the authors perform the preparatory work for making these images available to ancient art history and, as an unwanted side-effect, 'detach' them from the mirrors to which they are materially bound.

[9] New York, Metropolitan Museum of Art 1972.118.78, around mid-fifth century, of Argive (?) workmanship. See Congdon 1981, 191–2, cat. no. 83; Mertens 2006.

[10] On the mirror as a gendered object, see recently Lee 2017.

[11] See the recent book edited by Michael J. Squire on sight and the ancient senses: Squire 2016.

[12] For a discussion of the context of use of mirrors (here centered on later box-mirrors), see Heinemann 2019, 350–3.

[13] A good sample of these images is depicted and discussed in Frontisi-Doucroux and Vernant 1997, fig. 5–29. See also the short overview in Lee 2017, 150–7. On depictions of mirrors with their reflected images in vase-painting, see Balensiefen 1990, 20–38.

[14] See Frontisi-Doucroux and Vernant 1997, 59–65. Even though this becomes a dominant theme only in Roman times, one cannot but think of the myth of Narcissus (Ovid, *Metamorphoses* III 402–510), whose falling in love with his own mirror-image in the water has tragic consequences. See Frontisi-Doucroux and Vernant 1997, 225–30; Elsner 2007, 132–76.

[15] Aristotle, *Nicomachean Ethics* 1155a 22: ἔοικε δὲ καὶ τὰς πόλεις συνέχειν ἡ φιλία ("friendship seems to hold together also states"). See also Plato, *Gorgias* 508a.

[16] Plato, *Alcibiades* 133a. See the discussion in Bartsch 2006, 41–56.

[17] Plato, *Phaedrus* 255d. We are entitled to think here of the modern phrase that 'beauty is in the eye of the beholder'.

[18] On embodied objects in the Classical world, see e.g. Bielfeldt 2014 and the special issue of *Art History* edited by M. Gaifman and V. Platt (Gaifman and Platt 2018, with a useful introduction to this growing field of classical scholarship on pp. 404–8). R. Bielfeldt's work on lamps and their relation to vision is of particular interest in the present context. See e.g. Bielfeldt in Squire 2016, 123–142.

[19] See F. Frontisi-Ducroux in Frontisi-Ducroux and Vernant 1997, 112–32.

[20] Alcaeus fr. 333: οἶνος γὰρ ἀνθρώπωι δίοπτρον.

[21] Pindar, *Nemean* VII 14. This metaphor applies particularly well to the kind of poetry for which Pindar was famous in antiquity, namely songs in praise of winners in athletic contests (as e.g. in Olympia or, here, in Nemea), in which the deed of the praised winner is set in parallel with the deeds of the heroes of mythology.

[22] Achilles Tatius, *Leucippe and Clitophon* I 1.12. In this passage, we actually deal with the description (*ekphrasis*) of a painting of the abduction of Europa by the bull (alias Zeus).

[23] Achilles Tatius, *Leucippe and Clitophon*, VI 6.2.

[24] Achilles Tatius, *Leucippe and Clitophon*, V 13.4.

[25] Homer, *Odyssey* XII 39–54.

[26] On hunting and eroticism in ancient Greece in general, see Schnapp 1997.

[27] For a brief summary of these discussions, see Congdon 1981, 13–8. Recent descriptions of the caryatid figure tend to leave open the question of identity, see e.g. Lee 2017, 147–9.

[28] Most of them were later melted down later due to the high re-use value of the metal.

[29] As a general rule, attributes in archaic and Classical Greek art do not function as unequivocal signifiers of identity, as art-historians would like them to function, and as they do much later in Christian art. On this aspect, see Dietrich 2018a.

[30] On the agency of the viewer in the identification of figures in archaic and Classical Greek art, see Dietrich 2018b.

[31] Paris, Louvre Br. 1687, around 470–60 BC. See Congdon 1981, 158–9, cat. no. 43. On smell and the ancient senses in general, see the recent book edited by M. Bradley: Bradley 2015.
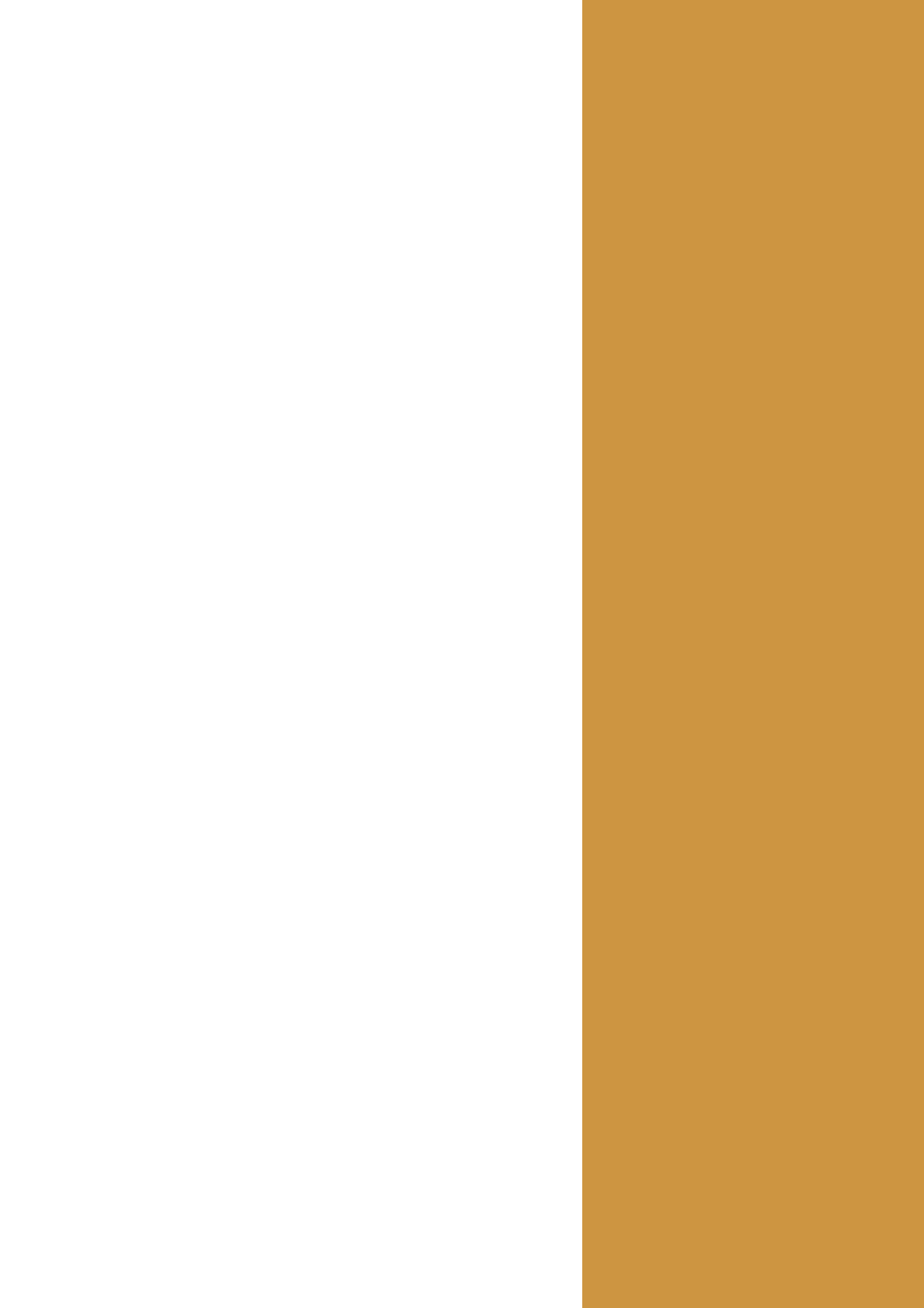
[32] See e.g. Aristophanes, *Thesmophoriazusae* 136–140.

[33] Boston, Museum of Fine Arts RES.08.32c.2, around 420–340 BC. See Schwarzmaier 1997, 266–7, cat. no. 79. An important discussion of this mirror is Stewart 1997, 177–81.

[34] Athens, National Museum St. 312, around 330 BC. See Schwarzmaier 1997, 252, cat. no. 43; Stewart 1997, 171–7.

[35] A. Stewart concludes his study of this iconography on Greek box-mirrors with the following remark: "The more apparently gynaikocentric the image, the more it actually reinforces the patriarchy and helps to oppress the woman who enjoys it." (Stewart 1997, 177).

[36] To what kind of interesting results an iconographic-cum-material perspective on Greek mirrors may lead may be seen in Heinemann 2019.

Contested Affordances:
Ancient Roman Coins, Economic Cycles, and Changing Socio-Political Contexts

Elisabeth & Sven Günther

Abstract

Money, trust, transactions – these three keywords that seem to describe our (post) modern age, have been the motor of most societies ever since. Coins embody abstract concepts of value, measure, legal tender, and exchange; and these concepts, by framing the production, use, and receptions of the coins, shape and even reshape the coins' materiality and thus their affordances. This holds especially true for ancient times. Flans of bronze, silver, and gold were minted into coins by workers, using engraved dies that "coined" images and legends into the surface and thus made them valid currency. Yet, there occurred, at times, overstrikes, countermarks, scratches, erasures, graffiti, drills – and the metal coins preserve and store all such alterations until now, what makes them readable like a "biography". This unfolds narrations of ever-changing affordances and thus stimulates modern research with questions about the interdependencies of institutions, human interactions, and the material qualities of things that have impact on human life. Not surprisingly, the primary affordance of coins is to serve as money. Acceptance and trust are two basic conditions to guarantee money's smooth circulation and thus enable economic transactions and exchange. Ruptures in this system challenge the affordances of coins, but also create new affordances, as we will show in three case studies from the Roman imperial period. In all these cases, coin denominations and regional limits of coin circulation are key factors for challenging and re-creating affordances. This brings us back to the overall ruling monetary function of coins, being the backbone and mirror of financial, political, and socio-economic systems. Nonetheless, reflecting and discussing the material and visual aspects of coins and their impact on us makes us think afresh about our relationship with the world, all the more in our modern, increasingly virtualized society.

The Socio-Political Impact of Coins
in the Greek and Roman World

Sometime around 445 BC, Aegina, the once proud island in the Saronic Gulf, ca. 27 km away from her ever rival Athens, began to issue silver coins (staters = double drachmae) with a land-dwelling tortoise on their obverse (Fig. 1).[1]

Figure 1: Silver stater from Aegina, 350–338 BC.
With tortoise on the obverse, an incuse square divided into five sections
with a dolphin and the letters "A" and "I", the abbreviation for Aegina, on the reverse.
33mm, 12.25g.

Figure 2: Silver drachma from Aegina, 650–550 BC.
With worn sea turtle on the obverse and an incuse square on the reverse.
15.3mm, 5.90g.

This was allegedly tantamount to a revolution, as since the advent of Aeginetan coin production in the mid-sixth century BC, a sea turtle (with flippers) had been the badge on the obverse (Fig. 2),[2] being either associated with the Greek goddess Aphrodite or deriving from the form and name of pre-coinage ingots used by the islanders.[3] With the dramatic decline of Aegina's vital oversea trade activities both over the course of and as a consequence of the Persian Wars (490–479 BC) and its membership in the Delian League, (re-)enforced by the hegemon Athens around 457 BC, the narrative constructed by many modern historians is clear: the change of motifs occurred as a recognition of the loss of her trade empire and made the new focus on the island manifest. Yet, the actual story behind this is far more complex. The tortoise-coins likely appeared only after the autonomy clauses for Aegina and the other allies in the Thirty Years Peace 446/5 BC between Athens and Sparta had been settled. It formed the last phase of classical coin production on the island before the Athenian expulsion of the Aeginetans right at the beginning of the Peloponnesian War 431 BC. Indeed, already prior to the turn from sea to land testudo, the turtle-coins had undergone several changes in style, both on their obverse and reverse: on the obverse from a smooth shell with five or more buttons on the back, and shell-segmentation before the Persian Wars, to T pattern button arrangement on the shell around 470 BC, and, on the reverse, from irregular incuse square (*quadratum incusum*) to a Union Jack style, followed by a windmill pattern and eventually by different skew-patterns dividing the *quadratum incusum* into five segments.[4] Hence, the change was not as dramatic as it seems at first sight, and the reasons need not be related to a political statement of loss and weakness, something as unthinkable to a polity then as today. The affordance of the new tortoise issue might better be related to economic purposes, viz., to distinguish the new types from older, worn, and low-weight examples,[5] and consequently might have been a visible and tangible attempt to regain trust in Aeginetan coinage that had once dominated the markets around the Aegean Sea.[6]

Figure 3: Silver denarius minted in 42 BC.

On the obverse, head of Brutus to the right framed by legend, BRVT(us) IMP(erator) L(ucius) PLAET(orius) CEST(ius), on the reverse a *pilleus* between two daggers below legend, EID(ibus) MART(iis): "On the Ides of March". 18mm, 3.49g.

This example shall warn against exclusively reading coins and their images in a political framework, and neglecting thereby their main affordance, viz., to be employed and used within economic transactions. Only few instances from Antiquity relate to us as to how a coin image was actually per- and received, and, of course, these literary mentions provide only one possible perspective on the appearance of the intention, communication, and perception process evolving around a coin issue. The most famous example is certainly the "liberty"–coin of two of the murderers of Caesar, Marcus Iunius Brutus and Gaius Cassius Longinus (Fig. 3)[7]. It was minted in silver and gold and likely produced by a mint in Asia Minor before the march to the decisive Battle of Philippi in October 42 BC against the forces of the triumvirs Mark Antony and Octavian, the later Augustus.[8] With its portrait of BRVT(us) IMP(erator) and the name of the minting commissary L(ucius) PLAET(orius) CEST(ius) on the obverse, and the liberty-cap (*pilleus*) between two different daggers and the date of Caesar's assassination EID(ibus) MAR(tiis), "on the Ides of March" (March 15th) two years earlier (44 BC) on the reverse, the image of this coin type not only commemorates the liberation of the Republic as perceived by the murderers and their faction (cf. the description of the historian Cassius Dio writing at the beginning of the third century AD: Cass. Dio 47.25.3), but also became an exhortation to defend this newly acquired liberty in the coming but eventually deathly engagements against the avengers of the Dictator Caesar in the context of issuing it to the soldiers of their armies. Interestingly, this call for (military) action was clearly understood, at least in the Civil War period evolving from the death of the last Julio-Claudian emperor Nero in AD 68 where an anonymous, similar, and at least nowadays rare type appeared, now with portrait and legend of LIBERTAS ("Liberty") instead of Brutus on the obverse, and the continuing (from obverse to reverse) legend P(opuli) R(omani) (left and right across field) RESTITVTA (below) ("[Liberty] of the Roman people restored") (Fig. 4).[9]

Figure 4: Fourrée silver denarius from the Civil Wars, minted in spring or summer AD 68.
Draped bust of Libertas to right on the obverse, indicated by legend LIBERTA[S].
On the reverse, *pilleus* between two daggers, P(opuli) R(omani) to left and right across field,
RESTITVTA below, obverse and reverse legend pulled together:
"Liberty | of the Roman people restored". 17.5mm, 2.85g.

Whether it was issued before or after the assisted suicide of Nero on June 9th (or 11th), AD 68 remains, however, unclear. Yet, the subversive character of the legend that presupposes the already executed murder of the "tyrant" and the anonymity of the issue only makes sense if it circulated before the suicide of Nero, and probably even before governor of Hispania Tarraconensis and future emperor, Servius Sulpicius Galba's imperator acclamation and open usurpation two months earlier.[10] Regardless, Galba himself made the personification of liberty, *libertas*, whose portrait was shown on the obverse of this anonymous issue, re-appear on the reverse of an official issue, now holding the liberty-cap in her right hand (Fig. 5).[11]

Both cases illustrate vividly how affordances of visual images are deeply connected with the materiality of the ancient medium the and respective context, and equally how they are subject to potential contestations: while Aegina's old worn and light-weighted coinage obviously lost its affordance as trustworthy currency in the economic cycle and thus had to be replaced, the liberty-message of Brutus (and Cassius), once issued to save the Republic, was rendered suitable for imperial times, wherein the tyrant emperor could be challenged but always within the framework of the necessity of a self-declared "good" emperor to continue imperial rule and defending liberty for the Roman people.

Figure 5: Bronze as of emperor Galba, AD 68–69. Galba's portrait on the obverse, with his name and titles: SER(vius) GALBA IMP(erator) CAESAR AVG(ustus) TR(ibunicia) P(ostestate). On the reverse personified *Libertas* holding a *pilleus*, LIBERTAS PUBLICA ("public liberty"), S(enatus) C(onsulto). 21mm, 8.55g.

Affordances, Materiality, and Imagery of Coins

"You see even in the matter of coin, (…) how many means the assayer uses to try the value of coin, the sight, the touch, the smell, and lastly the hearing. He throws the coin (denarius) down, and observes the sound, and he is not content with its sounding once, but through his great attention he becomes a musician."[12] This passage, written by the Stoic philosopher Epictetus (AD 50–138) in the Roman imperial period, describes the work of *nummularii,* staff in official mints and private banks that was responsible to control coin production, to detect and to sort out fake coins circulating on the market. It is a fascinating and unique evidence for the multisensory dimensions of coins as daily life objects – an aspect which has recently gained ever more attention within scholarship but is not yet fully explored, providing much potential for future research.[13] A coin's unusual appearance, size, weight, or even sound could raise suspicion among merchants or consumers, and result in an examination by a *nummularius.*[14] Much as today, not all coins used in economic transactions passed unnoticed through people's hands. It was not only the presentation of innovative images and texts on the coins that could catch a person's attention, like the aforementioned *libertas* motif, but also an unusual feeling in the hand, e.g. an irregular shape of a coin, scratches on the surface, or an alteration of the elevated image and legend; indeed, the coin tester's job was seen as difficult business (Petron. *Sat.* 56.1: "He [sc. Trimalchio] said, 'what do we think is the most difficult profession after writing literature? I think the doctor's and money-checker's: … the money-checker, who sees copper/bronze through the silver.").

In this regard, affordances of coins result directly from their material qualities. They want to be held, felt, moved in the hands of their users, and in some cases, one may be eager to hear their sound, smell, or even taste[15] them. Their handy size makes it easy to explore the haptic qualities and sensualities of coins. It might be the shiny surface of the metal which adapts itself to the temperature of the human skin and contributes to the human sympathy towards and desire for coinage, much like jewelry. Hence in his *Natural History,* the Roman author Pliny the Elder (AD 23/4–79) criticized the human "hunger for gold,"[16] stimulated by the introduction of coinage.

There is, however, a second layer of affordances, obviously culturally trained, but nevertheless deeply connected with the coins' materiality. Coins serve as money, made to enable small or large transactions on the market or in long-distance trade, and to pay workers and soldiers. For this purpose, coins are given a specific design (in Antiquity by casting or striking with dies) to prove their validity, guaranteed by a public institution or authority. The Greek cities chose specific symbols and legends to represent the minting city, e.g. a turtle/tortoise for Aegina (see above),

or the famous owls for the coins of the Athenians; the Romans minted the heads of gods/goddesses on the front side (obverse) of their coins in the Republican period, foremost the city-goddess Roma. In turn, during the Roman imperial period, the emperor's head and his official titles were usually shown on a coin's obverse, a phenomenon which began with the depiction of living Romans by means of their portrait on coins in the very late Republic.

This very specific function of coins and their actual use as money (in terms of medium of exchange; standard of payment; measure and storage of value) is thus the first affordance, and, if no suspicion whether the coin is real or fake arises (as in the case of coins that must be checked by *nummularii*) then the system works perfectly and smoothly. This system, however, depends heavily on the acceptance of coins, and thus not only on their metal weight and design, which both guaranteed validity in ancient times (there is a gradual development of turning away from pure metallistic ideas towards nominalism and fiduciary coinage, i.e. that the denomination itself guarantees the acceptance[17]), but also on the coin circulation. Coins circulated mainly in a specific region, usually within the borders of the minting authority (and bound to a certain denomination and weight standard), but they could also spread further, yet only if they were accepted. Acceptance and trust were hence key concepts for payment and trade, and could be built on authority, power, and control.[18]

The circulation of coins and their (at times high) production volume[19] set the scene for a further layer of culturally trained affordances: their imagery and iconography respectively. In the Roman Empire, the depiction of the emperor's portrait and the legend documenting his current offices and titles signaled the authority and validity on the coins' obverses, while the reverses sent messages of political, social, religious, sometimes economic, and rarely juridical relevance, propagating the emperor's deeds and duties, victories, tax reliefs, and other events, among others. Generally, coins emphasized the success of the *res publica* with personifications of happiness (*felicitas/hilaritas*), security (*securitas*), prosperity (*fortuna*), peace (*pax*), and so on.[20] Not without reason, coins are often considered to be ancient "mass media"[21], with images part of and forming a widespread framework of "visual language" intelligible even for Romans unable to read. Literary and epigraphic sources indicate that images and legends on coins indeed caught the attention of the people.[22] Nonetheless, the different denominations in gold (*aurei*), silver (*denarii*), and aes, i.e. bronze/brass (*sestertii, dupondii, asses, quadrantes,* etc.), were used for different purposes (payment of large sums/daily life), in different groups (rich elite/soldiers/ordinary people), and had different scales of circulation. Generally, aes coins were minted for local purposes and circulated mainly at a

regional scale, and hence often displayed locality-bound topics, while silver and probably gold coins were often minted for troops or higher officials throughout the Empire. They were thus transported over long distances to their destination, though sometimes diffused through the economic cycle, and hence could specifically target different audiences, at least in the first reception phase.[23]

The material qualities, imagery/legends, and coin circulation provide affordances on different levels. On the one hand, they are deeply connected with the acceptance of coins as money in the economic cycle and trust in their validity; on the other hand, other affordances are transmittable and perceivable through this primary economic usage, especially in terms of representation, affirmation, and propaganda. Normally, a monetary system works perfectly and guarantees all of the aforementioned affordances with their sundry positive, and negative, impacts. However, ruptures and changes in the economic, social, and political sphere can challenge these frameworks of trust and acceptance, and the entangled affordances. Much as the Aeginetans were compelled to respond to changing economic, and perhaps political, frameworks, and the Roman liberty-message had to be re-framed in different periods of times, in order to bridge such ruptures, we shall show in three further case studies as to how affordances were contested during the Roman imperial period.

New Affordances?
Countermarks on Roman Imperial Aes Coins

Traces of how coins were treated, and/or checked, in ancient, and especially Roman imperial times, are manifold. Scratches, graffiti, chisel punches at the edges, or small imprints of letters and symbols on the coin occur throughout all periods and regions and attest of various, conscious as well as unconscious, usage of coins in their life cycle. Particularly remarkable are the so-called countermarks on Roman imperial coins, i.e. stamp marks and/or symbols punched into coins after production, and mainly after already circulating for some time. Different from bankers' marks, also called punchmarks, which were for testing the purity of mainly gold and silver coins, countermarks are found on aes coinage (i.e. coins made of copper, bronze, brass) during the Early Roman Empire. They were not merely used for verifying official coins. While any alteration, or manipulation, of Roman gold and silver coins, mainly the denominations *aureus* and *denarius,* was strictly prohibited by the *lex Cornelia de falsis* ("Cornelian law on counterfeiting"), issued in the times of the *dictator* Sulla (82–79 BC), aes coinage, comprising *quadrantes,* *asses, dupondii,* and *sestertii,* was only covered by the *lex Iulia peculatus* ("Julian law on criminal appropriation of wealth, belonging to the state or public

institutions"), issued under Caesar or Augustus, where, *inter alia*, admixture of base metal was prohibited for all coinage, which hardly made any sense for aes coins. This was probably due to the fact that many institutions, not only the Roman mint, but also provincial cities, issued aes coins for enhancing small payment in the respective region where this coinage mainly circulated, and that they were mainly accepted based on their metal weight.[24] Hence, reasons for countermarking aes coinage were manifold; by means of contrast, contested gold and silver coinage was rather melted down than countermarked due to the aforementioned strict rules enacted by the *lex Cornelia de falsis*.[25] For the Roman West, and especially in the Rhine area, where systematic studies have been conducted,[26] the reaffirmation of the validity of existing currency, the revaluation of existing currency, and ideas of representation, propaganda and commemoration in context of donations (*donativa*) for soldiers are the main reasons for punching with countermarks. Countermarks with PRO for *pro(batum)*, "approved," or BON for *bon(um)* "good" are found in Germania inferior (Fig. 6).[27] Also, and only there, countermarks AS and DVP(ondius) for revaluation of existing currency denominations are found (Fig. 7).[28] Most countermarked aes coins, however, bear the abbreviated name stamp of the emperor, one member of the imperial family, or a governor/military commander, and were probably connected with the act of (military) donations, though most donatives were spread in gold and silver coins. The donator, often the emperor directly (AVG or AVC, for AVG(usti), "of (the) Augustus," but also sometimes the intended military unit,[29] are not only marked but also commemorated in this way, producing visible and tangible forms of loyalty bondage.

Figure 6: AE sestertius of emperor Claudius with countermark PRO(batum),
"approved", applied under emperor Nero or in Flavian times in Germania inferior.
36mm, 26.04g.

Figure 7: AE sestertius of emperor Claudius with cut and three countermarks,
applied between Neronian and Flavian times. On the obverse, IMP(erator)
and a barely unreadable countermark (PRO? for PROB(atum)?), on the reverse DVP(ondius),
indicating the denomination change. 34mm, 21.27g.

Interesting in this respect are countermarks on coins of the contested emperor Nero (reg. AD 54–68). Extravagant in his lifestyle and a populist ruler, Nero was perceived ambiguously: while traditional senators saw Nero undermining the dignity and glory of the imperial office as well as the at least nominally feigned joint rule of the *res publica* with the Senate, he was very popular among the people, both in Rome and also in Eastern cities of the Empire whose cultural traditions he reportedly favored and supported. His suicide on June 9th (or 11th) AD 68 was the result of the declaration of him as a public enemy by the Senate following the uprising of Vindex in Gaul and later by the future emperor Galba in Spain, and was accompanied by counter-imagery in coinage, to delegitimize his authority (see above). In this climate of emerging distrust in AD 68 and the struggle over his succession, namely the Civil Wars in the Year of the Four Emperors AD 69, we see that many aes coins of Nero were countermarked, while only some seem to have been withdrawn and overstruck. Countermarks, often applied to the neck portion of Nero's portrait, such as SPQR (S(enatus) P(opulus)Q(ue) R(omanus), "Senate and People of Rome") or PR (P(opulus/i) R(omanus/i), "(of) the Roman People") attest of the idea to return rule to the Roman Senate and people, and are probably rather early in date, perhaps already come the Vindex's insurrection (Fig. 8).[30] Others show names of legions or of the then struggling emperors and usurpers: for Galba, the first successor of Nero, we find GALBA, GAL(ba)CA(esar)

in Latin, ΓΑΛΒΑ or ΓΑΛ(βα)ΚΑΙ(σαρ) in Greek letters, stamped on Nero's face (Fig. 9);[31] for the following candidates on the throne in AD 69, Otho, Vitellius, and Vespasian, we find similar countermarks at various places within the Empire, targeting different audiences, mainly army troops. However, not only on "Roman" aes coinage of Nero, mainly examples from the "supporting" mint in Lugdunum (Lyon, France) from whence it was distributed "empire-wide", was countermarked; this also happened also for civic coins of (Greek) cities.[32] For all of these countermarks, we can grasp the different affordances implied by and applied to Nero's aes coins in these turbulent times: Ensuring the (re-)validating of Nero's aes coins (or civic aes coins with his portrait) as legal tender necessary for economic transactions in times of shortages in money production and contested acceptance of both, the emperor and his image as well as his coinage went hand in hand with the spread of messages transmitting various content, e.g. political ideas, declarations of loyalty or authority, and the occasional notion of expressing dissociation from the past emperor by physically violating his image through the deliberate placement of the countermark.

Figure. 8: Bronze as of emperor Nero with countermark SPQR for
S(enatus)P(opulus)Q(ue)R(omanus), "Senate and People of Rome,"
applied during the Civil War period AD 68/69. 29mm, 10.91g.

Figure 9: AE sestertius of emperor Nero, struck in AD 64-67,
with countermark ΓΑΛΒΑ on Nero's face, applied during the Civil War period
on the behalf of the emperor Galba. 33mm, 22.59g.

Changing the past?
Challenging affordances with *damnatio memoriae*

The ambivalent treatment of Nero's aes coinage touches on the topic of *damnatio memoriae*, "damnation of memory". Nero was the first emperor to be officially declared a public enemy (*hostis*), whence erasure of his name and image was conducted after his death, both officially and unofficially.[33] Yet, unlike suggested by the modern Latin term's usage, neither this exact phrase nor any comprehensive concept of what erasure of memory comprised in Roman Antiquity existed; the terminology and specific sanctions included in damnation procedures varied.[34] This can be explained by the different contexts in which such damnations occurred. In case of Nero, official and more comprehensive measures could be easily undertaken due to the end of the Julio-Claudian Dynasty and the gradual emergence of the idea that, at least politically, the guise of continuity was not as important as new ways by which to define imperial and senatorial roles.

This was different some thirty years earlier. Emperor Caligula (reg. AD 37–41), son of the popular Julio-Claudian family member and general Germanicus, was very popular among the army and normal people at the beginning of his rule after the death of emperor Tiberius (reg. AD 14–37). His new understanding of imperial rule, not with but over the Senate, and his frequent challenge of traditional imperial roles and social interactions that were so important within the senatorial circle for upholding the idea of the *princeps inter pares*, brought him a sudden death due to a conspiracy by praetorian guards after only four years of rule, on January 24th AD 41. The new emperor Claudius (reg. AD 41–54), Caligula's uncle, was then tasked with the unenviable endeavor of distancing himself from Caligula, who was

not only son of the famous Germanicus but also great-grandson of the first emperor Augustus (via his mother Agrippina the Elder), and great-grandson of Augustus' wife Livia and of Augustus' civil-war enemy Mark Antony (via his grandparents Drusus and Antonia the Younger). Yet, how could he be excised from the family memory without destroying the public image of the Julio-Claudians? How might a balance between a continuity of dynasty and break with a badly-judged predecessor be negotiated? We can trace some methods as to how Claudius sought to manage this delicate task in the literary sources and archaeological evidence (Cass. Dio 60.4.5–6; Suet. *Claud.* 11.1, 3)[35]. Although Caligula was not officially declared a public enemy, and hence no formal damnation of memory occurred, Claudius annulled Caligula's acts and even let his predecessor's images be removed by night; Caligula's death was not included among the festival days, although it marked the beginning of Claudius' reign; in fact, the two days of his murder and the immediate, turbulent aftermath wherein restoration of the Republic was in the air were obliterated from memory, and he declared an amnesty except for the conspirators against Caligula, who were put to death; consequently, Claudius himself celebrated his ascension day (*dies imperii*) not on January 24th, the day of Caligula's assassination, but on January 25th. Ultimately, the *damnatio memoriae* was carried out de facto. Portraits of Caligula were reshaped into the likenesses of Claudius; in inscriptions, his name was erased; albeit both not systematically.[36] In terms of coinage, it is recorded two years after his death, in AD 43, that the Senate decreed to melt down Caligula's aes coinage, and that Messalina, then-wife of Claudius, used this to create a statue for the actor Mnester (Cass. Dio 60.22.3). Regardless the question of the political symbolism of the statue of Mnester dancing as the incestuous priest-king Cinyras on the very day of Caligula's murder (Jos. *AJ* 19.1.13.94–5; cf. Suet. *Cal.* 57.4),[37] the archaeological evidence confirms that not only aes, but also gold and silver issues of Caligula are less frequent in contexts than one would expect, although present nonetheless.[38] Both, his aes and gold/silver coinage was not declared void; the remelting might have occurred mainly for obvious aes coins with Caligula imagery in Rome, where the Senate exercised control, while only a gradual withdrawal e.g. via tax payments is plausible in the provinces since small cash was always lacking and a general collection would have harmed the economy. Anyway, erasure of Caligula's name, especially the distinctive C (for "Gaius"), countermarks with Claudius' name (and imperial title) (Fig. 10),[39] or overstrikes with Claudian types are present in the archaeological record[40]. This act coincided with the halting of aes production on authority of the Senate in Rome throughout Claudius' and partly Nero's reigns, and it is thus likely that this claim of senatorial authority was countered by Claudius, who could not pursue totally erasing Caligula at the cost of undermining his own imperial authority.[41]

Figure 10: Bronze as of emperor Caligula for Agrippa, his maternal grandfather,
with countermark TIB(erii) CLAV(dii) IMP(eratoris) (in ligature), "of Tiberius Claudius emperor"
applied under emperor Claudius, perhaps for the distribution of a military donative. 10.99g.

More radical and "total" *damnationes memoriae* were witnessed by the historiographer Cassius Dio, whose own experience influenced his description of the aforementioned earlier acts of damnation within his *Roman History*. Cassius Dio, offspring of the senatorial elite from the province of Bithynia on the southern coast of the Black Sea in present-day Turkey, started his successful career under the emperor Commodus (reg. AD 180–193). He witnessed the second huge civil war for imperial power in AD 193, the so-called second Year of the Four Emperors. It was the general Septimius Severus, born in the Libyan city Leptis Magna, who eventually prevailed and founded a new dynasty, the "Severans", although he officially succeeded the former "Antoninian" house by forged adoption into the family of the emperor Marcus Aurelius (reg. AD 161–180), thus becoming a post-mortem brother, and "good" counterpart, of Commodus. This seems quite a grotesque family bond from a modern perspective, yet Septimius Severus was able to stabilize the empire, and at the time of his death on February 4th AD 211, his two sons, Caracalla (born AD 188) and Geta (born AD 189) were old enough to succeed him. What happened next is unique in the history of Rome: In December AD 211, Caracalla murdered his own brother in the family's private chambers. Cassius Dio describes the fratricide with the following words: "but when they [Caracalla and Geta] were inside, some centurions, previously instructed by Antoninus, rushed in in a body and struck down Geta, who at sight of them had run to his mother, hung about her heck and clung to her bosom and breasts, lamenting and crying: 'Mother that didst bear me, mother that didst bear me, help! I am being murdered.'" (Cass. Dio 78.3.2, trans. Cary 1960). Interestingly, the author frames this horrible event by unfolding the narrative of an extremely cruel and ruthless Caracalla, who had already condemned some members of his closest circle, among them his wife Plautilla (Cass. Dio 78.1.1–2)[42]. He traces back the hatred of Caracalla towards his brother even to the lifetime of Severus, when he spontaneously decided to kill his father instead of Geta (Cass. Dio 77.14.2–15). For Cassius Dio, Geta is the helpless victim, slaughtered like a sacrificial animal (Cass. Dio 78.1.4–6) and Caracalla is the undisputed ruler who lures his brother into the deadly trap; indeed, Caracalla ordered a systematic eradication of Geta's likeness and name from the public record.[43]

Figure 11: Aes coin minted in Stratonikeia, AD 198–211.
On the obverse, a portrait of Caracalla on the left, erased portrait of Geta
on the right, a countermark below between them. ΑΥ ΚΑΙ ΜΑΡ ΑΥ ΑΝΤΩΝ... ΓΕΤΑC.
On the reverse, the goddess Hekate standing to the left with burning torch and dog.
ΕΠΙ ΑΡΧ (name of the magistrate) CΤΡΑΤΟΝΙΚΕ/Ω-Ν. 36.8mm, 22.78g.

On most aes coins that depicted both Caracalla and Geta, only the portrait of Caracalla is still visible, while the face of Geta has been carefully erased, usually in combination with a countermark (Fig. 11)[44]. Yet, this *damnatio memoriae* was not carried out with equal diligence in the Roman provinces, as a study of the aes coinage there shows.[45] While the first *damnatio memoriae* in such an enormous scale, its concrete execution depended on the respective audiences within the Roman Empire. Furthermore, a political perspective reveals that Geta also obtained the title of an Augustus and became equal in terms of power to Caracalla, allegedly between AD 209 and 211.[46] He even styled himself on coinage akin his father,[47] certainly a provocation for Caracalla. Thus, Geta's *damnatio* seems less driven by Caracalla's emotions towards his brother than rather a brutal strategy to strengthen and secure his own imperial rule which was threatened by the rise of his brother.

Yet, sometimes a damnation offered new affordances. An aureus from the emperor Macrinus, who succeeded Caracalla after his murder in AD 217 for only 14 months, displays traces of violence against the emperor's face: someone had scratched it with a sharp tool (Fig. 12)[48]. The materiality of the coin, representing the minting authority (here Macrinus), obviously possessed the affordance of becoming the target of a person's reaction, expressing his or her (probably private) reaction toward this emperor.[49] On the other hand, the affordance of the gold coin to serve as jewelry might have later inspired its transformation into a necklace much later, as the small rectangular hole above Macrinus' bust indicates.

Figure 12: Gold aureus of the emperor Macrinus, AD 217–218, with cuts and scratches. Portrait of Macrinus on the obverse with his name and titles: IMP(erator) C(aius) M(arcus) OP[EL](lius) SEV(erus) MACRINVS AVG(ustus). Reverse: Felicitas, the personification of felicity, is no longer visible; the legend contains further titles of the emperor: PONTIF(ex) MAX(imus) TR(ibunicia) P(otestate) CO(n)S(ul) P(ater) P(atriae). 20.5mm; 6.03g.

Affordances and Circulation: Overstrikes as Political Message?

However, we also find visual contestations of the imperial house during the 2nd century AD, which was allegedly "calm" until the turbulent last quarter, namely in overstrikes of Roman coins during the Jewish Bar Kokhba Rebellion. In AD 132, under the emperor Hadrian (reg. AD 117–138), a man named Simon bar Kokhba ("son of the star") in the literary and numismatic sources led a rebellion against the Romans. Until AD 135, he and his followers controlled a considerable territory south of Jerusalem.[50] According to Cassius Dio, this uprising was a Jewish reaction to the renaming of Jerusalem into Aelia Capitolina (named after the emperor himself), including the building of a temple for Jupiter on the holy temple mount (while the Jewish temple had already been destroyed during the Jewish War under the emperor Vespasian in AD 70); furthermore, a Roman law forbade circumcision, an important part of the Jews' religious rites and identity (HA *Hadr.* 14.2)[51]. Therefore, the rebellion sought to re-establish the traditional lifestyle and the culture of the Jewish people,[52] initially in a limited territory. Hence, they needed "to create a sovereign, proclamatory, and abundant coinage"[53], and, in turn, they needed money towards this end. Central for the economic and financial system was that Simon bar Kokhba leased land to the Jewish peasants who were compelled to pay with silver coinage.[54] To keep this money cycle running, the rebels needed to coin "own" money despite being without access to mines in large quantities: this they accomplished by overstriking Roman aes and silver coins, partly booty and partly circulating money paid in by Jewish peasants.[55] This clever move required a highly organized system of collecting and reminting coins, employing the materiality and thus affordances of the pre-existing Roman aes and silver coinage. The "new" design was simple and reduced, displaying ritual vessels

and items of the Jewish religion, and choosing an ancient type for the legends ("year one of the redemption of Israel", "year two of the freedom of Israel", "for the freedom of Israel").[56] Although the bronze coins were hammered and flattened before the overstriking, the images and legends of the silver coins persisted in many cases, and are still visible today.[57] In Fig. 13,[58] the letters of the older Roman legend are still visible – and tangible – on the obverse under the grapes. On the reverse, the trumpets[59] are, probably by chance, placed on the face of the emperor Trajan, Hadrian's predecessor. His characteristic profile with his nose, lips, chin, and shoulder appears next to the right trumpet. On the lower part of the coin, the Greek legend ("AYTO[κρατωρ]", translating the Latin title "imperator") indicates that the silver coin was minted in an eastern province of the Roman Empire. It thus seems that this coin was still circulating under the emperor Hadrian, and was possibly already worn and thus a good choice for overstriking.

This process of re-minting, driven by economic thoughts, resulted in a highly symbolic design similar to the scratching of the emperors' faces on coins described above. The Jewish rebellions physically – and ideologically – stamped and reshaped the surface of the coins,[60] and thus propagated their superiority over the *imperium Romanum.* Nonetheless, the Jewish peasants confronted with the new currency were probably less than willing to accept it, at least at the onset, and even more since the overstriking was so obvious: it simply disrupted the main affordances of the underlying Roman coins, viz. to be widely accepted money (cf. the discussion on accepting worn Hadrianic (and Trajanic?) coinage in later times in the Babylonian Talmud: Bab. Talm. *Nez. Avod. Zar.* IV, ad Mishna III, 52b, Rav Oshaya's opinion is altered by Abaye).[61] The design of the Bar Kokhba coins, its uniformity, and its choice of very traditional symbols and letters can thus be understood as the (at times successful) attempt to foster trust in the validity of this new currency, although it was only accepted within a very limited territory.[62] Only within the limits of its circulation could the coins gain new affordances, very probably being less the result of a cultural renewal than of the strong and violently enforced need for money to prevent the breakdown of this presumably fragile economic system.

Figure 13: Silver Zuz of the Bar Kokhba Revolt, AD 132–135. Attributed to year 3 (AD 134/5),
with a bunch of grapes on the obverse, and "Simon" in paleo-Hebrew letters.
On the reverse, two trumpets and the legend "For the freedom of Jerusalem" in paleo-Hebrew.
Greek legend and portrait of emperor Trajan still visible. 3.29g.

Conclusion

The dictum "economy first" also applies to ancient coinage. The main function, namely to be part of economic transactions (military, state payments, private businesses, etc.), was the first and foremost affordance, not only with regard to the materiality of the metal coin, but also in respect to the visual symbols that attested to authority aimed at building trust and confidence in its value, validity, and acceptance. In turn, with economic transactions and circulation, messages of political, social, religious, and/or cultural importance could be disseminated, and provide further affordances, e.g. of representation, propaganda, and stimulation. And yet, all of these affordances could be easily contested by violating the essence of a coin as money, the trust in its value, validity, and acceptance, that is, by attacking its material and visual surface. However, Roman laws forbade this for silver (and gold) coinage, which makes sense from an economic and political point of view since this coinage gradually became a fiduciary money whose contested authority could shake and challenge the foundations of imperial power and the commonwealth alike; if necessary, there were other ways to withdraw it from the economic cycle, but the effort was rarely made. The ancients clearly knew what constituted "good" and "bad" gold and silver money, and this not only in economic, but also at crucial times in political terms.[63] Thus, the real "battlefield" was aes coinage. Circulating mainly locally and for small payments, it was perfectly suited to contesting political enemies and stances, to condemning a public *hostis*, or to adding messages of representation and propaganda, and calls for action, especially at times of civil war. And yet again, its core affordance, to enhance economic transactions, was rarely challenged. Aes coinage could be even broken into fractions, to produce smaller denominations by oneself when they were not immediately at hand.[64] This certainly violated the visual and haptic affordance of a round coin, but economic needs also prevailed in such extreme cases, and could produce a heavily altered, new material affordance, that is, if it was allowed, trusted, and accepted.

Abbreviations

GIC = Howgego, Christopher J. 1985. *Greek Imperial Countermarks. Studies in the Provincial Coinage of the Roman Empire.* Royal Numismatic Society, Special Publication XVII. London: Royal Numismatic Society.

RPC = Burnett, Andrew, Amandry, Michel, and Ripollès, Pere Pau (eds.). 1992–. *Roman Provincial Coinage.* London: British Museum.

RRC = Crawford, Michael H. 1974. *Roman Republican Coinage.* 2 vols. Cambridge: Cambridge University Press.

RIC = Mattingly, Harold et al. 1923–. *Roman Imperial Coinage.* London: Spink & Sons.

SNG = *Sylloge Nummorum Graecorum.*

TJC = Meshorer, Yaʿakov. 2001. *A Treasury of Jewish Coins. From the Persian Period to Bar Kokhba.* Jerusalem: Yad Izhak Ben-Zvi Press.

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Notes

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[2] Heidelberg Center for Cultural Heritage (HCCH) of the University, AN21. Photo: Susanne Börner. http://pecunia.zaw.uni-heidelberg.de/ikmk/object?id=ID294 (07.11.2020). Reference: SNG Copenhagen 14.501 (and the following ones).

[3] Cf. Sheedy 2012, 106.

[4] Cf. Sheedy 2012, 106–8.

[5] Sheedy 2012, 108–9.

[6] See S. Günther 2020a, 28–9.

[7] Classical Numismatic Group, Triton XXIII, 20 January 2020, lot no. 620.
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[8] Woytek 2003, 525–8; cf. McCabe 2016.

[9] Classical Numismatic Group, Triton XXIII, 14 January 2020, lot no. 677.
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[10] Cf. Walburg 2007/8, 113–5.

[11] Bochum, Kunstsammlungen der Ruhr-Universität, M 2480. Photo: Robert Dylka. http://ikmk.ruhr-uni-bochum.de/object?id=ID399 (07.11.2020), there wrongly described as sestertius. Reference: RIC I² Galba 251 (no. 423).

[12] Epict. 1.20.7–8, trans. Higginson 1890; cf. Plin. *HN* 33.44–5.127–8.

[13] Kemmers 2011; Krmnicek 2009; Weisser 2020.

[14] Wolters 1999, 368–71.

[15] Carrying coins is in the mouth is attested in some Greek literary sources, see e.g. Aristoph. *Vesp.* 609, 787–95; cf. Figueira 1998, 499.

[16] *Fames auri*: Plin. *HN* 33.14.48.

[17] See Wolters 1999, 352–62.

[18] On military commanders in the Greek world and their strategic use of coin-money, see S. Günther 2020b.

[19] For the organization and output of Roman mints, see Wolters 1999, 85–114.

[20] Wolters 1999: 290–308; Hekster 2017; for the frameworks of identity, values, and gender roles in the Severan period, see also E. Günther 2016.

[21] e.g. Christ 1991, 62; for contrary views esp. in older literature, cf. the discussion in Wolters 1999, 255–65.

[22] Wolters 1999, 318–20.

[23] Wolters 200/1; Aarts 2005; Kemmers 2009; for the location of the mints in the Roman Empire, see Wolters 1999, 45–85.

[24] See Wolters 1999, 362–71.

[25] See Werz 2009, 78–81; RPC I for the different provinces; collection also in Martini 2003, updated in the Museum of Countermarks on Roman Coins 2020.

[26] Werz 2009.

[27] Classical Numismatic Group, Electronic Auction 441, 3 April 2019, lot no. 262. https://www.coinarchives.com/a/openlink.php?l=1450649|2979|262|b48ccd53a58d9051ba 1b349e2fa56e88 (08.11.2020). Reference: Martini 2003, no. 48.

[28] Classical Numismatic Group, Electronic Auction 441, 3 April 2019, lot no. 261. https://www.coinarchives.com/a/openlink.php?l=1450648|2979|261|8eb32fb760a35b39234 c93bf27fbbb91 (08.11.2020). Reference: Martini 2003, nos. 46 and 47 (third, barely readable countermark maybe PRO(batum)?, cf. ibid., no. 48).

[29] Werz 2009, 81.

[30] Classical Numismatic Group, Electronic Auction 440, 20 March 2019, lot no. 278. https://www.coinarchives.com/a/openlink.php?l=1448786|2976|278|908a74d94dfed60654 e64c68095e496f (08.11.2020). Reference: Martini 2003, no. 26.

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[32] Calomino 2016, 70.

[33] Calomino 2016, 63–79.

[34] List and discussion in Calomino 2016, 12–6.

[35] Cf. Wolters 1999, 154; Calomino 2016, 55–6.

[36] Calomino 2016, 56–7.

[37] See Wolters 1999, 154–5.

[38] Calomino 2016, 58–9; cf. Wolters 1999, 137.

[39] Dr. Busso Peus Nachf., Auction 417, 2 November 2016, lot no. 133. https://www.coinarchives.com/a/openlink.php?l=934149|1793|133|79e04d0579df89f03659 3b30e506c790 (08.11.2020). Reference: RIC I^2 Gaius 112 (no. 58) (coin); cf. Martini 2003, no. 51.

[40] Calomino 2016, 59–62; Wolters 1999, 157–61.

[41] See Wolters 1999, 155–7. 161–2.

[42] For the damnation of Plautilla and her father Plautianus, see Calomino 2016, 121–3.

[43] Calomino 2016, 119–153.

[44] Heinrich-Heine-Universität Düsseldorf (HHU), Ls4252.33.08. Photo: Sebastian Lindermann. http://www3.hhu.de/muenzkatalog/ikmk/object?id=ID7386 (07.11.2020). Reference: SNG von Aulock, no. 2686var.

[45] Calomino 2016, 130–148.

[46] Kienast 2004, 166.

[47] Pangerl 2013.

[48] Classical Numismatic Group, electronic auction 460, 29 January 2020, lot no. 698. https://www.coinarchives.com/a/openlink.php?l=1605143|3396|698|d6fa55e60685e0755ef 61ae958ea7b75 (07.11.2020). Reference: RIC IV/2 Macrinus 7 (no. 20, obv. c).

[49] Cf. the scratching of Augustus' face on coins from Kalkriese, Germany, by local peoples: Kemmers 2011, 98–99; for similar cases throughout the Roman imperial period: Calomino 2016, 62, 108, 163, 177, 192–5.

[50] See Mildenberg 1980, 320–325.

[51] Considered important by Mildenberg 1980, 334, but less by Meshorer 2001, 137 who stresses the political aspect of the revolt (135–7). Further measures are discussed in Stemberger 2014.

[52] Mildenberg 1980, 330.

[53] Mildenberg 1980, 328.

[54] Mildenberg 1980, 315.

[55] Mildenberg 1980, 326.

[56] See Mildenberg 1980, 329–30. For the archaic script, see Meshorer 2001, 163.

[57] Meshorer 2001, 137–9. The author rightly stresses the fact that the smoothening of silver coins would have caused the loss of precious metal (137). That the less valuable bronze coins were indeed smoothed and hammered indicates that the visibility of the former Roman design should not only serve as a political message but was the result of rational economic thoughts.

[58] Ida & Larry Goldberg Coins & Collectibles, Auction 117, 15 September 2020, lot no. 2165,
https://www.coinarchives.com/a/openlink.php?l=1698660|3802|2165|2179be919be9f9e42f e06e185bc7a9d8 (07.11.2020). Reference: TJC 277.

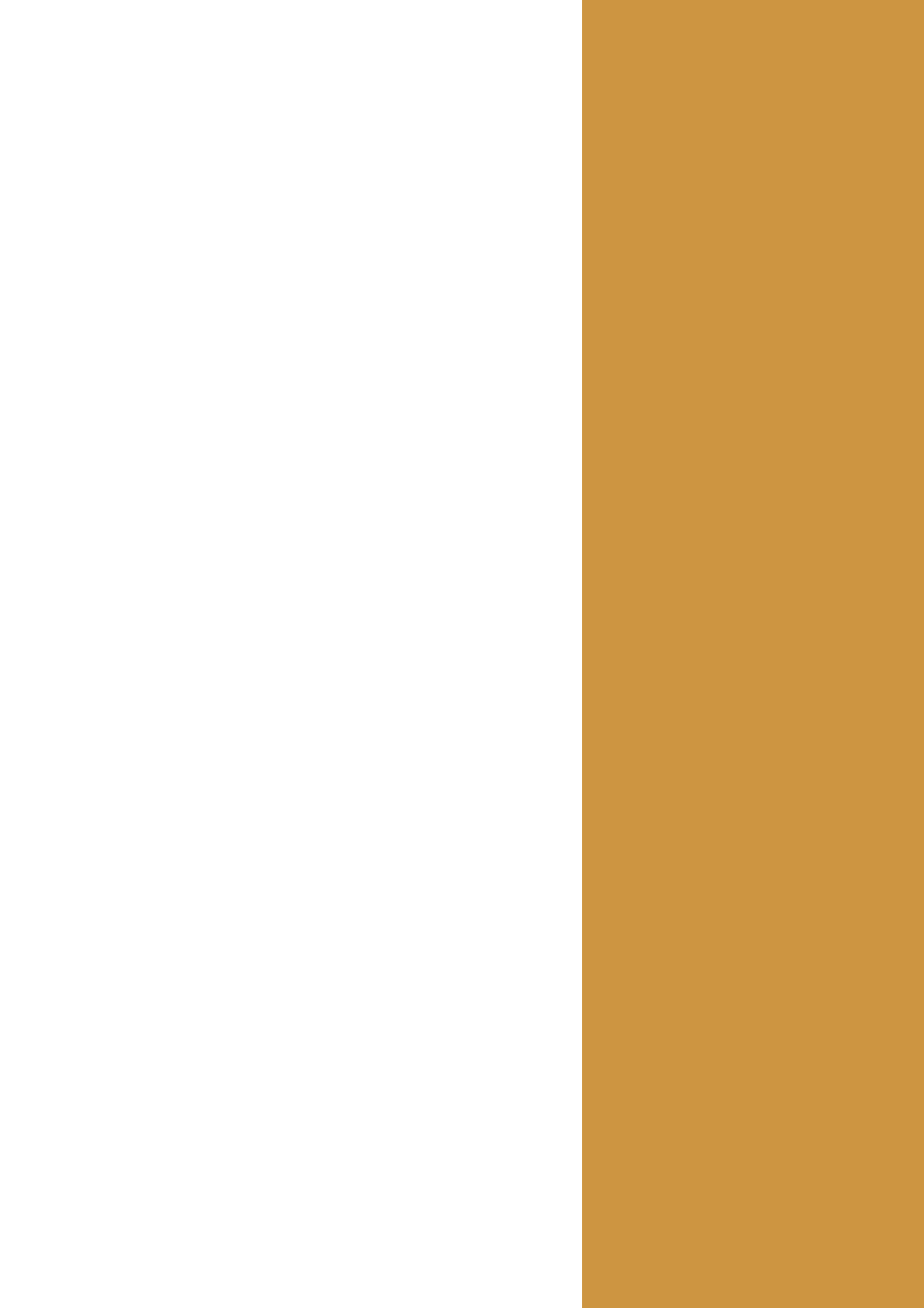[59] For the meaning of the trumpets, see Meshorer 2001, 153–5.

[60] Meshorer 2001, 137.

[61] Cf. Lambert 1906, 241–2.

[62] Cf. S. Günther 2020b on warfare coinage in the 4th century BC.

[63] Cf. Wolters 1999, 316–7, 371–94.

[64] Cf. S. Günther and von Berg 2019, 84 with n. 13.

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