

img journal

interdisciplinary journal  
on image, imagery  
and imagination

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MANIFESTO

Manifesto

EDITED BY

Alessandro Luigini

Chiara Panciroli

KEYNOTES

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Pietro Pietrini

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Franca Zuccoli



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# Manifesto

edited by  
Alessandro Luigini  
Chiara Panciroli

## KEYNOTES

James Elkins  
Pietro Pietrini

## ESSAYS

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# EDITORIAL

ISSUE 01 OCTOBER 2019 Manifesto

Alessandro Luigini and Chiara Pancioli

In early 2017 a group of researchers from different disciplines and hailing from at least 8 different universities, published a *call for papers* for a conference to be held at a small private university in the mountains on the border between Italy and Austria.

In late November.

The promoters would have been quite satisfied if the call had been answered by a few dozen young researchers, because they wished to discuss a topic that had been of interest to everyone for some time, but that each investigated independently relying on their own disciplinary tools.

When the call ended, there were more than 300 authors and approximately 220 submissions.

And at the end of the conference, it also snowed.



If it hadn't actually happened, the prologue to this editorial might be a good idea for the incipit to a *genre novel*. But that is exactly what happened to us and to some of our colleagues who are promoting this new journal with us.

On November 27<sup>th</sup> and 28<sup>th</sup> 2017, about 200 scholars gathered in Bressanone-Brixen, a lot more than we could have imagined (and perhaps even wanted): with some teething problems that may easily be forgiven in a nascent project, the conference proved stimulating, very profound, open and informal. As organizers, one of our greatest satisfactions was to walk through the hallways during the pauses between the parallel sessions and see an art historian engaging with a mathematician, a pedagogue with a designer, an architect with a neuro-scientist, to discuss the role of images in their research: the interdisciplinary approach, which we had been seeking from the moment we chose the title of the conference, was working.

*IMMAGINI? International and interdisciplinary conference on image and imagination, between representation, communication, education and psychology.* A rather unusual name, so long as to seem inappropriate, but which contained the seed from which the new *IMG journal* has now germinated: scholars of representation and graphic science, graphic designers, pedagogues and psychologists. Of course, one could easily argue that these are not the only areas in which the themes of images and imagination are studied and investigated, but for us they represented the four vertices of a skewed figure, so distant from one other as to define a wide area that could accommodate many other intermediate and interdisciplinary points of view (Luigini, 2018, Luigini and Panciroli, 2018).

The ample and unexpected participation in *IMG2017* convinced us of the need to reflect on the potential of this project, and among the many possibilities, all together, we decided to confirm the space for discussion that had been created and to make the conference biennial and itinerant, so that the following one was held in July 2019 at the Department of Architecture in Alghero: an open and interdisciplinary project might have run the risk of waning if it was always held in the same place. But when we decided to propose the conference again, we felt that something was still missing. After a long period of further reflection, we came to understand that the size of the conference, given the figures confirming that *IMG2019* would also be widely attended, would make it impossible to explore some of the research studies as deeply as they deserve. To the horizontal connection of the conference, where ideas and disciplines confront and cross-pollinate one another, we wished to add an opportunity for vertical study, which only a scientific journal can provide.

## IMG journal

These were the premises for founding the *IMG journal* – *interdisciplinary journal on image, imagery and imagination*, a journal that aims to collect and disseminate interdisciplinary research revolving around the themes of image, imagery and imagination.

The magazine will be published every six months, with issues in autumn and in the spring, and each issue will focus on a monographic theme. One in every four issues will be inherent to the biennial *IMG conference*, while the others

will each be handled by one or more issue curators, and will include a thematic and monographic focus. Each issue will also contain a *composite* section that will feature articles not pertinent to the monographic theme, so that research which responds to the questions that the journal raises in general, may be published in a timely manner for scientific dissemination. The term *composite* is intended to evoke not only its miscellaneous nature, but also, in the science of materials, the characteristic of a material that, formed of different components, takes on the best characteristics of each giving rise to a better material: a perfect metaphor for the added value of interdisciplinarity.

The journal will be full English, but will give the authors the opportunity to publish their text in their mother tongue as well; all texts sent by the authors in their mother tongue will be published only on website in only-text format. Last but not least, the magazine will be completely *open access* in all its contents because we are firmly convinced of the need to share knowledge. Our choice of *open access* is a conscious one, perhaps the only one which we have never had to discuss or argue: our intention is to publish valid research but also to create connections, and open access is the only context in which these connections are free to develop, even independently from the promoters of the journal.

The place of the journal in the scientific context of reference deserves mention.

It is evident that the project was born with all the requisites to aspire to international circulation –full English, open access, free, ready for indexing– but the main reference, at least for now, is the Italian academic system. Specifically, the criteria for recognition by ANVUR (National Agency

for the Evaluation of Universities and Research) have all been guaranteed, but perhaps the most important aspect of our project does not favour the journal's placement: interdisciplinarity. Recent ministerial policies, it seems, have rewarded a structure based on disciplinary sectors and the primary evaluations for research products (ASN, VQR, ANVUR journals) become problematic in most cases for research and publications considered "borderline", interdisciplinary or simply at the margins of the disciplines. However, while respecting the "rules of the game", we believe it is important to promote open and interdisciplinary scientific research. For this reason, we have resolved to meet the needs of all the main sectors to which the promoters of the journal belong –both bibliometric with indexing and non-bibliometric with the assignment of an ISBN to each monographic issue– and we hope to find space for publications from different backgrounds.

## Issue 01. Manifesto

We decided to use the first issue of the journal to explain the interdisciplinary and collective nature of *IMGjournal*: in fact, we asked the members of the scientific committee and the associated editors to voluntarily submit a text, synthetic or extended at their discretion, that would present a disciplinary or personal point of view on issues related to the focus of the journal, proposing experiences in both basic and applied research.

Scholars of representation, visual communication, education, psychology –with incursions into art history, semiotics or aesthetics– present in this *Issue 01* a multiplicity of points

of view that all, however, focus on the core concern of the magazine: images, what they are, how they are conceived, how they are produced, how they are perceived.

Ultimately, we believe that the heterogeneity of the first Issue is one of the aspects that qualifies the project positively, as a collective project. Issue 01 is thus configured as an actual *Manifesto*.

A collective *Manifesto*.

## Post Scriptum: one final note

Among the supporters of the journal there are many eminent scholars from different scientific fields. The composition of the scientific committee reflects this support as well as the national and international scientific relationships we have developed. We are grateful to everyone, but in this list it is impossible not to notice the absence of one name. The name of the person who, by irony of fate, was the first supporter and the one who most insisted on launching the journal, but who died prematurely in April 2019. We owe a great deal to Prof. Vito Cardone: for this project his absence is and will remain tangible.

We would like to remember him by quoting the words with which he opened another interdisciplinary conference sponsored by UID during his presidency, in which he referred to the *IMG2017* conference. Words that, when we read them today, appear as an indelible cultural testament.

*“Individually and as a scientific community, we must open up new avenues, accept difficult and stimulating challenges, [...] it is also about meeting and dialoguing, working together, with other scientific communities [...]. We cannot not cultivate transversal, multidisciplinary and interdisciplinary relationships, or as I prefer to say, transdisciplinary ones: because we must not limit ourselves to meeting and engaging in dialogue with experts from other disciplinary sectors. We must also make an individual effort to reach beyond our borders. Without descending into a deleterious polymathy, we must seek a deeper understanding of the specificities and reasons of others, to move confidently forward with them.”*

(Cardone, 2019, p. XIV)

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# IMAGINING IMAGES

## SEVEN PROBLEMS

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## KEYNOTE ESSAY 01/01

VISUAL STUDIES  
BILDWISSENSCHAFT  
IMAGES  
IMAGINATION

The following text is the transcript of the keynote held at the IMG2017 conference at the Faculty of Education of the Free University of Bozen, on November 27, 2017 in Brixen campus, on a video plenary session. Seven problems are presented to define some stable points and some perspective to outline a theory of images. The seven problems are:

1. Why it may be a good thing that few people know what image is.
2. What is not an image?
3. Aesthetics and politics.
4. Do images have a nature?
5. The madness of classifying images.
6. The limits of scholars' attention to detail.
7. The materiality of image.



Out of the infinite field of image and imagination I have just chosen seven problems. I hope they fit the conference; I have read through the really interesting list of sessions and papers that you're all about to have and I picked out seven topics and I hope will have some resonance with what you say. First of all, I am going to talk a bit about the fact that very few people have theories about what images are. It is puzzling and interesting that so many people can get along without thinking about what an image is but that might be a good thing in the end.

Then couple of slides on the question of what might count as something that is not an image because when you start studying images you tend to want to include all sorts of things especially mental images. But then things that do not seem very visual, like pages of text for example. So, there is this very fundamental text of what might have count at any given instance as something that is not an image. Then couple of slides on the very next question of the relation between images as static objects and images as objects of political meaning, or political action, or action in the world. This is the same thing as aesthetics, or anti-aesthetics, or political art or aesthetic art, or modernism and postmodernism. It is a big problem and I just have couple of things to say about it that I hope are pertinent to the conference. And then the question about the nature of images it is a question of anthology, it is a philosophic question which I think many people will prefer not to engage because there is pragmatic, or a performative, or a practical way of dealing with images in different disciplines that allows most of us to avoid the question of whether or not images have a nature. But that question is very far reaching so I think it is important to keep it on the table. Then a little bit on my favourite topics which I think it is fundamentally odd or perhaps even crazy to try to classify images in a way that other objects like mathematical objects, for example, can be classified. But classification in the name of the archive, for example, is an absolutely essential part of most research programs. So images are subjected to this

kind of bureaucratisation and administration in the name of many different projects. So it seems to me important also to think about the psychological violence and institutional consequences of trying to classify your images.

The last two sections have to do with a special interest of mine about the limits of this course in especially art history in my field but in neighbouring fields. The limits of this course of the detail of the image and that includes the materiality, so I have separated this but they are actually combinable. I am going to conclude with just one screen with very tentative answer to some of this question.

## 1. WHY IT MAY BE A GOOD THING THAT FEW PEOPLE KNOW WHAT IMAGE IS



Maybe it is a good thing that only a few people actually know what images are, they think they have a theory of images.

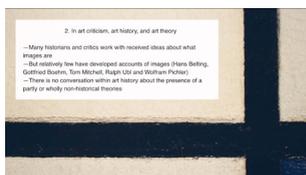
I am going to take example of this conference called *What is an image?* (which is now a book) and when we first started the conference, which was held in Chicago back in 2008, we began with the question “Why ask, what is an image?”. I have three slides to suggest the kind of questions, that three different disciplines ask about images. This time my background images are pictures of a student of mine copying a Montreal painting in the art institute. I am going to come back to this question when I talk about the last two topics about detail materiality. Now that is rubber gloved student’s hand trying to recreate a very, very particular kinds borders, of stripes in the Montreal paintings. They are not simple when you start looking at them closer, they are quite complicated objects.

First of all, from the point of view of studio art, art students, young artists, art makers it is often assumed that the visual arts exist separate cognitive realm from language, logic. That is the whole “right brain/left brain” difference which is largely disproved by contemporary neurology. Anyway it is still very common in the art world.



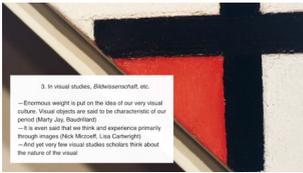
That leads the assumption that some things can be communicated through the visual and not through other senses or media. And, also, in studio art environment it is widely assumed that the visual is politically privileged. There are a lot of politically active art practices and they can sometimes imply that political practice in general are optimally visual art practices, which is a really interesting and radical claim that under rights fair matter of what happens in the art world. These are reasons why people who are practicing artists might want to ask the question “What is an image?”

I will take away this, so you can compare more easily my students copy to the original. It has this very complicated three-dimensional relief structure. Montreals in 1920s do it very narrow, simple two-dimensional optical objects that are hard to copy.



Second. From the point of view of art criticism, art history, and art theory, many historians and critics work with other peoples' ideas about what images are. There are relatively few theories that exist, that are used and made by art historians and art critics about images. Hans Belting has a theory of images, Gottfried Boehm, W.J. Thomas Mitchell, Ralph Ubl and Wolfram Pichler and I can make the list longer but it is not a very long list. It is maybe not more than a dozen people who are currently working in and around art criticism, history and theory and actually have theory about images. And there is no conversation within art history about the presence of these partly or wholly non-historical theories. In other words there are theories and general notion of images out of play do and all the way up to people like Belting, Boehm and Mitchell. Those theories proper to be able to describe images in general for our experience and understanding but there is no conversation within the discipline of art history, about the presence of those non- or trans-historical theories in a historical discipline. They are themselves anomalies and also quite uncommon.

Third. In the field of visual study, visual culture studies, Bildwissenschaft-the German version of visual studies, there



is an enormous weight on the idea that we live in a very visual culture. Perhaps the most visual culture ever, so it has been claimed. Marty Jay said that it is associated with Baudrillard. And it has been even said we have come to think and experience primarily through images. That is a claim you can find by Nick Mirzoeff and Lisa Cartwright. They both write visual culture studies and texts. That is another really radical and interesting claim and as far as I know no one has tried to explore exactly what the consequences of such claim might be that we actually think through images. But very few visual studies scholars think about these issues directly, or talk about them directly, and there is very little talk about the nature of the visual.

In all three of these areas: art production, art history, visual culture, images are central but they are often taken as a given. In the event that we had in Chicago *What is an image?*, that led us to this question that I think was a very curious one. I am going to leave it open until the last screen of this talk. “What is enabled by not pressing the question, What is an image?”. In other words, how is it that not perusing, not answering, not engaging this question “What is an image?”, how is it that it is a productive strategy for so many fields and so many disciplines?

## 2. WHAT IS NOT AN IMAGE?

Here is another poster for another conference, this one was in Berlin in 2014 and I co-workedized this, as you can see at the lower left, with several other people. This was a conference which was intended as critic for visualization and infographic. Because we had this idea that we live in a period of visualization euphoria where people assume that visual forms of the display of the information are optimal for understanding and analysis in any discipline. We invited a very wide range of people to talk about what they thought could not be, or should not be, or was not helpful to be imagined

as a picture in their field. Here is our line of speakers, you can see if you look over the page. They vary from physicists, to people in literature, we also had a couple of literate critics, who did not normally write about images at all. I just want to say a little bit about the two that are in the red box. We had an economist, Werner Reichmann, who works in Konstanz, as one of our speaker and also Mary Morgan, who is an expert on eco-visualizations in economics. Mary Morgan gave a paper on those very simple-looking economist's graphs, the one that just show the first quadrant and a line that just goes straight up and down. Reichmann reported on graphs like these one-financial advisor graphs, that show anticipated forecasts of earnings into the future. You can see that from the moment of the present on to the future, the forecast has a certain error built into it. Werner noted that, quote: "for some reason the future is always blue in these graphs", that was enough all of a sudden to make most of us to think of them as images.

The most interesting of the graphs, slides that Werner showed was this one. This is similar to the one he showed, it is not the exact one. He was talking about working on the German bond market and he said that there is one spreadsheet that people who watch the German bond market always have on the computer screen. It has a continuously updating list of German bond prices and especially there was one column or one row at the bottom of that chart that he showed, which gave a crucial number for the exact value of German bond prices at that moment. He was speaking about this as an image and a problem that he raised for us was that it was very difficult for us to say to him that is not an image. If anything is not an image, that is not an image. It is not even a page of formatted text, the formatting does not matter, the colour does not matter and all the rest of that. But we could not easily say that because the terms of his analysis were very closely related to the terms of our own analysis of what we thought of his visual material. It has a lot to do with forms of attention, in the particular form of attention that he said that

bond traders brought to that one last row. Maybe it was just that one last cell of the spreadsheet was very much like forms of attention that we were theorizing using theories of the gaze and other tools like that. This is the way that the question “What is not an image?” came at that visualization conference in Berlin. There are many other ways of talking about this, there are even theological ways. But this one seemed to me particularly pertinent I hope to your conference because you have a lot of examples (as I can guess from the titles of your papers) of analysis that could be applied to things like these that are perhaps not obviously to be thought primarily as images. They might be thought of as something else—graphs, or charts, or notation and so on.

### 3. AESTHETICS AND POLITICS



This topic is another enormous topic but I just want to approach it as one isolated example. If you move the street view car just a little bit, you see the seal a little bit more from the front. Then Google realizes that it is not a face. This time I want to report on a conference, now also a book, called *Image Operations*, which was held in Berlin, and that is a photo of one of the two conveners Charlotte Klönk. The book is now published by the Manchester university press.

Her question for the conference, the lead question there was: “What does it mean that images are not only operations (for example in medicine, in things like the Da Vinci machine, which allows doctors to operate on a patient without actually touching, they just operate on a computer console, and in warfare where you have for example missiles with video cameras in the nose of the missile, images are operations in various contexts) but also sometimes people are killed for images”. And this is Charlotte Klönk’s exam as in ISIL videos where prisoners are executed. Images kill, images can prompt people to kill, and sometimes people are even killed for images.

The idea of the conference was to push the question of performativity and the action of images in the world as far as it could be pushed. Not just to say that images are performative, not just to say that they are something more than framed objects on a wall, or architectural environments. But to say that they can actually cause deaths in a direct way. The conference was very much aligned toward the political and very much disengaged from the aesthetic history of fine arts and aesthetics of images.

I think that this question in its general form about politics and aesthetics is one of the principal unresolved issues in art theory. The problem keeps coming back in waves. There was conceptualism, there was Hal Foster's anti-aesthetics starting in 1980, there is Nicolas Bourriaud's relational aesthetics (his book with that title "Relational aesthetics"). There is a lot to be said about each one of those moments and others. There are moments in which the relation between the aesthetic content of an image and its political or social meaning appears as a kind as if it was a vinaigrette, as if in an image you have to keep quipping the oil and the vinegar together to keep them emulsified. If you let it go, or if you sit and watch, they keep coming apart again. The aesthetic does not detach itself from the anti-aesthetic.



In a 2014 conference the most intricate example of this was worked by the artist Trevor Paglen. He has in his work a politics, a political action which he proposes as an aesthetics, and he has an aesthetics that he proposes as politics. I am just going to give a screen about each of them and that is all I am going to say about this topic here. Here, is an example of an image by Trevor Paglen. He had a series of works in which he got as close as he could to military sights and then he would get a telescope and take pictures of things that he did not actually trans pass of this military sights.

Like the *Area 52*, where the US military supposedly keeps aliens and all the rest of that. He did not trans pass on them but he would stand sometimes miles away at the fence and he would take these photographs. And then he would title

them with the exact position he was in and the name of the military installation, as much information as he could find in the public. Very specific titles he chose, but the pictures themselves were very blurry. You are looking at something you can go and find online, it is a portfolio that the New Yorker put together.

Trevor says that his idea is to create “a tension” between the image itself which “means absolutely nothing” (it is just blurry buildings) and the title, which can lead or contain “very specific information”. “Knowledge and beauty” he thinks are in an “interesting tension”. And that tension is the work’s aesthetics. He wrote me this in an email back in 2009, quote: “A successful image for me is one that makes a statement and simultaneously undermines any possibility of a traditional truth claim based on that image. It is a sense of seeing/not seeing that I’m trying to capture”. So that is politics as aesthetics. And then there is aesthetics as politics, in the same email he says: “There is also a performative gesture I’m interested in—what are the politics of photographing some of these things, even though the photographs themselves don’t show anything?”. The picture becomes an operation in the terms of the conference, it becomes something performative.

There is a book I edited you can see on the right: *Theorizing Visual Studies, writing though the discipline* and in it I put this diagram when I was thinking about Trevor, I thought it would be fun to make a diagram. That book is full diagrams. So on the left that is the Paglen-Diagram in which I am imagining in an unquantifiable way that Trevor’s work is animated by the way it is pushed back and forth between politics and aesthetic. It is never clearly political, it is never entirely aesthetic. It is the vinaigrette metaphor you might say. Keeps the two things stirred together. But what I want to emphasize in this context for your conference is that I think that this is an unsolved problem and no one has a good account on how to describe social-political-ethical meanings of images and aesthetic meanings and qualities in the same sentence as part of the same thought, so there is always attention.



## 4. DO IMAGES HAVE A NATURE?



This is one of my favourite signs: “Caution! Dust storms may exist”.

There are scholars, like the German Gottfried Boehm, who do want to understand the nature of images-their ontology. And then there are other scholars like Tom Mitchell, for whom ontology is really something that other people believe in. This is another very profound, not adequately theorized issue in image study. So, I will have just one screen on of each of the two of them.



That is Gottfried Boehm. In the summer of 2006, the two of them-Boehm and Mitchell exchange letters. In one of the letters, Boehm redirects a question that he says guided him for number of years “How do images create meaning?”. This question he articulates though a series of concepts that he invented, including an expression that he invented the “iconic logos”. You can see in that expression “iconic logos”, there is a contradiction of terms and he noticed this and he has spent a whole life time thinking about what it might mean. He says that the recurrent idea is to ask how meaning “can articulate itself without borrowing from linguistic model or from rhetorical devices”-in other words outside some language. Nothing corresponds to this kind of ontological in Mitchell’s work.



There is Tom Mitchell. He is a good deconstructionist; he is interested in deconstruction. For him, what matters is what you can say and do with images, not their nature. In the *What is an image?* event I suggested that Nelson Goodman’s semiotics might appear as a kind of ontological ground in Tom’s writing. Because Tom takes semiotics like Nelson Goodman as kind of natural, unproblematic description of images. Therefore, it might be ontology images kind of the nature of images. He said, quote: “No, it’s just that Goodman has provided one of the most powerful, systematic, and wide-reaching answers to the question. But it’s a question everybody has an answer to. The answer can be made intelligible, more coordinated, more systematic, by reference to Goodman.

That is what I think is the great virtue of his generality.” This is a pragmatic or deconstructive approach to images in which what matters is how they make their way through the world, what people think of them, how they make people act, what kind of desires they set in motion. From that perspective images do not have an ontology, except in a fictive sense, except in the sense that other people like Gottfried Boehm might have believes about that.

But I think that this question, which you could say is a question, is made between ontology and deconstruction, or ontology and pismotality is one of those fundamental issues in the discussion of images. It is untheorized in the sense that a large number of us who work on images, spend their lives studying them, really do believe that there is something about an image that sets it apart from other things. We do have an incipient ontology, we do not usually develop that and in fact what we do as historians in particular we behave as if we were pragmatic, if not deconstructive, we look only at the effects of these things.

## 5. MADNESS OF CLASSIFICATION

Aby Warburg’s *Mnemosyne* is still the model of most art historians for classifying images even though it was a very eccentric project. But classification in some way is crucial and universal because classification is what produces our archive and every researcher’s archive, their evidence, their legible evidence or their image knowledge. Classification is often referred back to *Mnemosyne* project but that project is not a model is just that classificatory necessity, the need to classify in order to create knowledge is something that needs to be anchored somehow. Art history tends to anchor it this way, to Warburg. I think that Horst Bredekamp is right when he says that the administration of images is not well understood and that includes things like their curation, their labelling and all the rest, there all sorts of administration.



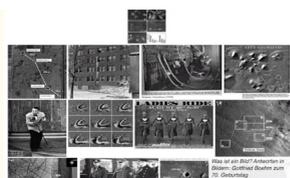
I just want to take 3-4 slides to suggest that there is a physiological dimension here. There is this hopeless desire that we have to control images. Here is one page from a really remarkable image archive that is currently being curated by Marion Müller (see her name in the middle). She is at the Jacobs University, which is near Bremen. She calls it: “Political-iconographic Archive of Vision”- this is the page for PIAV, the PIAV motive. You can see it is all very indexed and computerized. There is a lineax that leads from from this spect of Wargburg because Marion took over Martin Warnke’s *Bildindex* which in turn inherited Wargburg’s project.

This kind of classification has gone far beyond anything Wargburg could have imagined and it has reached the point in Jacobs University where there are people in the Computer Science department involved in classifying images for example from television. No one actually needs to watch these images, the computer does the watching and classifying. Two other examples of the madness of classification I might say. This is a selection of a piece by Lev Manovich, which he calls: *4.4 Vertov\_Eleven\_Montage*, in which he took each of the 654 shots in the film “The Eleventh Year”-Vertov’s film, and represented it by its second frame, the second frame of each one of the shots. It ends up with a kind of chaos that is half way between you might say a Dada collage and a piece of pop-art. But it is also part of Lev Manovich’s computer aided massive database analysis projects which he applies to things like Instagram as well.

Third and last example I want to give is this one.



This a Google *search by image* instead of results. The “search by image” function in Google at least up a few years did not use any textual or meta-data to help it find any similar images. I put in the image you see small on the top. It is an image of four scenes microscopic live. I put that one in and the Google *search by image* came by these crazy list of images. The second one in the first row there is a one of the worlds longest icicles, and then you can see down at the bottom is Hitler.



There is all sorts of odd things. The *search by image* function when it was working without the help of any text that surrounded the images and it was looking at the images themselves, provided a new kind of image arrays. Something with a logic that really could not be read. It has been read as surrealist but it is not surrealist because these are computer algorithms and they have nothing to do with surrealism. You can of course read it as poetic but all the available readings are readings into it. What it really is, is a new kind of sequence that so far at least cannot be interpreted partly because Google algorithms are secret.

These are just three examples, I am just telegraphing them, saying them more briefly than I should. But they are three examples of the kind of illogic that all classification results in, the classificatory impulse in relation to images is an odd one because the classification was something that was developed outside of images and now it is being applied to them.

## 6. THE LIMIT OF SCHOLARS' ATTENTION TO DETAIL

There are art historians who write a lot about detail, Daniel Arasse has written a book, Friedrich Teja Bach also has. But most of the time art history does not deal with detail past a certain point. I am going to illustrate that with some details of this Rembrandt's etching of his friend *Jan Six*.

This is actually nineteenth century photoetching, so is very close to the original. Here is the head in detail of that photoetching. The next picture I am going to show you is the most detailed image of this "Rembrandt's etching" in a book. And then the next picture is going to be the best slide of this image at the University of Chicago projected onscreen as it would be seen by a student, so the best view that a student can get of this. The last image is currently the best available image on the Internet, not including paywalls. The point I want to make here is very simple and that is that there is nothing in the literature on this etching, or on the painting



of Jan Six, that is more famous, that requires anything more than this level of detail: a pensive face, a thoughtful person, a friend of Rembrandt's. Art history does not tend to go any further than these images, it tends to read them at this level of generality. I know this is not an ordinary kind of critique of art history which does have its moments of attention to detail but this is what I just want to suggest here.

#### 6a LIMITS OF PHENOMENOLOGICAL LANGUAGE

Phenomenology plays a part in this because I think because it is a default, theoretical position for a lot of art history and theory. That is a night time scene of Borobudur in Indonesia. Of many examples I could have taken I am just going to name two. Two major books that are in this sense phenomenological because they rely on phenomenological terms: David Summers's *Real Spaces*, which is a huge attempt to rewrite the entire history of art using new conceptualizations. And Hans Belting's *ild Anthropologie* and his attempt to bring anthropological ideas into art history. They are both phenomenological in a sense that they both have difficulty and find a limit case anyway and when it comes to details that are finer, smaller details than standard phenomenological terms from Merleau-Ponty like horizon, body, orientation, symmetry, space, surface, above and below.

Borobudur for example is in David Summers's book because you are meant to experience Borobudur by certain navigation, you walk around and there is path that goes around and around in a spiral. It is the simple geometry of the spiral that counts for David and not the very, very intrigued series of experiences that you have with sculptures as you go up. David Summers also writes about Teotihuacan ruined outside of Mexico City and its main features is an enormous long avenue surrounded by pyramids. It has a central, linear symmetry and that is



what he writes about. When the symmetry starts to break down - for example the *Pyramid of the Sun* on the left is not symmetrical -, then phenomenological counts that have to do with things like symmetry, pattern, body and horizon have a little bit more difficulty. But they have more difficulty when it comes to the details on the pyramids, for example this is a small pyramid called the “Feathered Serpent Pyramid”, which has these amazing faces of Gods *Tlaloc* and *Quetzalcoatl*, they are called, even though that is not their original names.

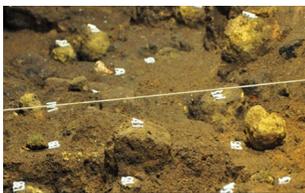
But these Gods stare right at you from the various levels and from the sides of the staircase. But a generalized vocabulary has to stop and does not have much power over things that are truly asymmetrical and too intensively detailed.

My last example here is the tunnel that was recently discovered under the *Temple of the Feathered Serpent*, so right in the middle you see the same temple from the previous photograph. They discovered a tunnel underneath it and they are still excavating it. There are tunnels under each of the major pyramids in Teotihuacan, some artificial, some natural caves. In this particular tunnel they have been finding amazing things-finds: sculpture, pottery, shells, but also rubber balls, pyrite mirrors, clay balls covered with something that looks like gold (it is actually a mineral jarosite).

The last report that I have heard from this excavation, that the excavation is slowed because they have reached a place that was filled with pools of Mercury. The atmosphere is toxic and they have built a small robot to go over these surface in that area. What I am suggesting here is that books like Summers’s and Belting’s and by extension I mean large parts of art history and criticism that depend on the vocabulary phenomenology have a point of difficulty when it comes to details. How to attach the discourse of details to the discourse of phenomenology and phenomenological criticism.



## 7. MATERIALITY OF IMAGES



I want to make two observations. First of all, that materiality is a big concern in art history these days. Like affect theory, which is often associated with a polyvalent theory. There is a wide spread interest in paying attention to art works materiality. Attention to its support, to its material, to its thingness and so on. I am going to give an example from the book *What is an image?*.

There is a detail of a Pollock painting, where you see couple of his hand prints. Jacqueline Lichtenstein, the French philosopher and art historian, who was at the conference said that art historians seldom speak about paintings. She wanted us at our seminar to pay attention to examples from the 19th century, especially Zola and Huysmans, who she said really knew how to write about images in detail.

She said: “In the distinction between image and painting, I would like to stress the painting’s physicality. Today, in the age of the Internet and the digital image, it is important to recall that the painting has physical and material properties.”



Marie-Jose Mondzain, who was also there, mentioned Daniel Arasse. There was the beginning of this conversation about how to think about materiality of images, in particular paintings and not just images. Beyond the materiality described by Huysmans, Zola, and others there are details which seem to be difficult to write about as history. Or to put it in another way, an art historian would have difficulty writing about things like you see in this slide because they seem to be just formal or just material, brute material. There seemed to be barrier, natural barrier, beyond which things do not signify historically and perhaps even not theoretically in a couching way but they belong to something like formalism or a close reading.

In other words there is a discursive boundary there.

I think it is actually possible to go further than these examples like Zola and and Huysmans and there is a more radical position. In the book *What painting is?* I set myself the task

of spending several pages on very tiny details, like this one, just one inch by one inch, to see if I could write about what was happening in a way that it will make contact with some other themes, potentially even historical themes.

These is much more detailed than what Jacqueline Lichtenstein was talking about.



I think that there a lot of problems with that book *What painting is?* and one of its main difficulties is that well enough grounded in history itself. But I would like to draw moral from this that it is probably not a discursive boundary, the problem of looking at, thinking about, writing about the smallest details and the most specific materiality's of art objects is not that those details are outside history, is that the interpretation at this level happens very slowly, takes a lot of time to figure out how to speak. I think that this could be extended to contemporary art as well. I had a student couple of years ago-Boris Osterov, who was trying to outdo every other artist that he knew by using more goopy paint in his paintings than anyone else did. I think that these questions about how detailed you can be when you write about something like this, like any image, is an open question. There is for many art historians the counter-example of Tim Clark's books, especially his book *Sight of Death*, which is about puissant painting. This is a detail of a tiny part of a puissant painting and Clark writes about that green stripe that runs across the middle and that is a very small detail about an art historian to write about. He talks about how it represents a field but I think he could have gone even further, because it is not even a single green stripe, it is many green stripes. There is a lot more in the book *What is an image?*.



## CONCLUSIONS

I know I am running over time here, so I am going to conclude quickly with one screen. Here are the seven topics that I mentioned at the beginning with some abbreviated responses:

1. *Why it may be a good thing that few people know what images are.* Because a lot of art history, theory, and criticism is enabled by remaining agnostic or vague about the nature of the visual. Something in what most of us do, many of us do, is made possible by not thinking about the nature of images as you are all going to be doing in this conference.

2. *What is not an image?* Well, nothing is not an image, if the visual is conceived as a quality or form attention, rather than as some formally specifiable properties.

3. *Aesthetics and politics:* I do not think there is a good way of understanding how they work together. I think it can be helpful in many cases to acknowledge the incompatibility of aesthetic in political discourse. Or of the political in an aesthetic discourse. A little bit aesthetic judgement often come in unexpectedly into very politically engaged discourses and vice-versa.

4. *Do images have a nature?* Yes, if you have a stake in kinds of knowledge or expression that are only possible with images. No, if you are more interested in what images do in the world.

5. *The madness of classifying images:* it is something many of us lose sight of (Maybe we have to, maybe that kind of madness is built into the study of images).

6. *The limits of scholars' attention to detail,* and

7. *The materiality of images:* there is a tremendous amount waiting to be written on the detailed moment-by-moment and inch-by-inch production, existence, and meaning of images.

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# **BRAIN, IMAGING AND IMAGINATION**

## HOW THE BRAIN REPRESENTS THE WORLD

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## KEYNOTE ESSAY 02/01

IMAGING BRAIN ANATOMY  
SUPRAMODALITY  
VISUAL IMAGERY  
CONCEPTUAL REPRESENTATION  
AGGRESSIVITY

The present work aims to describe the main results obtained from the neuroimaging studies on the study of those cognitive processes related to imaging and imagination. A brief excursus on the development of modern neuroimaging techniques presents the methodological background of the many studies. The relationship between sight, blindness and conceptual representation is explored. Research has shown that the ventro-temporal cortex is responsible for recognizing the surrounding environment, to distinguish an object from a face and, in general, objects' categorization. This area is responsible of imagery in both sighted and blind people, being its morpho-functional organization indepen-

dent of the visual experience. It follows that a very precise classification of all categories of objects could be obtained in the human brain, and it is supported by a distributed cortical representation independent from the sensorial modality. The last part of the paper presents a series of studies, in which the study of imagery was related to aggressivity. The prefrontal cortex is deactivated when an individual imagines himself becoming aggressive, being this effect more relevant in females than in males. As a conclusion, the neuroscientific approach produced important results in the definition of what imagery is, and showed its relevance to the study of how mind and brain work.

The interest in brain morphology is old, so as the interest about how the conscious life, mental activity and cognitive functions could emerge from the brain structures. Andrea Vesalio, known as the founder of modern anatomy, wrote in the famous text *“De Humanis corporis Fabrica”*, in 1543: *“Non nego che i ventricoli elaborino lo spirito animale, ma sostengo che questo non spiega nulla sulla sede cerebrale delle facoltà più elevate dello spirito. (...) Non sono in grado di comprendere come il cervello possa esercitare le sue funzioni”*. (\*)

Before the development of modern methods for the morphological and functional exploration of the central nervous system, in the mid-eighties of the last century, the studies on the brain focused on the observation of individuals, who had suffered from injuries. The first descriptions of serious personality and behavioral disorders, due to a brain injury, appeared in ancient times. One should think of the famous case of Phineas Gage described by the doctor John Martin Harlow in 1848 (Harlow, 1848). Gage served as a foreman in the construction of the railway line in Windsor County, Vermont. One morning he was victim of an accident at work, following the accidental triggering of an explosive charge. Gage was struck by an iron bar that penetrated the left cheek, pierced the skull, and came out of the frontal top. The Gage case has remained in the history of neuroscience, neurology, and psychiatry, not only because Gage was miraculously able to survive, but also because his character and personality changed radically, so that acquaintances concluded that “Phineas was no longer himself”.

It was soon realized that some fundamental functions were lacking in patients, who had suffered from lesions in the frontal lobes, like that of Gage. In fact, such lesions produce an unusual range of emotional, cognitive and behavioral changes. With the development of modern methods for morphological and functional in vivo brain exploration (such as positron emission tomography [PET], structural magnetic resonance [MRI] and functional magnetic resonance [fMRI]), it was possible to study the fine anatomical and functional architecture underlying the sev-

eral cognitive activities and the most complex and elusive mental functions. For example, emotional experience, behavioral control, abstract thinking, moral judgment, planning skills, programming, the distinction between good and evil, respect for norms, and social conventions (Koechlin et al., 2000; Nichelli et al., 1994; Pietrini, 2003; Raichle, 1994).

In their entirety, the results of neuroscientific research show how these sophisticated mental functions can be linked to the activity of precise brain structures, mainly located in the frontal lobe. By comparing the development and organization of the cerebral cortex in the human brain and brains of animals phylogenetically close to man (such as monkeys), we can see how the prefrontal cortex developed much more in the human brain.

Therefore, through the study the cerebral correlates of certain functions (such as abstract thought, moral judgment, the conceptual representation of the external world, and so on), we understand that the human being is the best, if not the only, animal model to be considered. In ancient Greek language, the verb “to know” οἶδα (pronounced “oida”) was the perfect tense of a verb that indicated the act of seeing (cf. ὄραω, pronounced “orao”), and meant “I saw, and therefore I know”. It also indicates that knowledge could not be independent from the visual experience. Even today, the relevance of sight is indicated by the frequent use of terms based on visual verbs: “Can you see my point?”, “I see what you mean”, “*Vedere la vita in rosa*”, “*Stravedere per qualcuno*”, “*Arrivederci*”, and so on. (\*\*)

From a neurophysiological point of view, the relevance of sight is in agreement with the finding that the cerebral cortex related to visual functions represents almost a third of the entire surface of the cerebral cortex.

These first considerations give rise to a spontaneous series of questions, not only from a neuroscientific point of view. How can people with congenital blindness represent a world they have never seen? How do they use brain structures dedicated to vision in the absence of sight? And, again,

to what extent is sight really necessary for the brain to develop its wonderful morphological and functional architecture? Finally, what can we learn from the study of the brain of blind individuals, about how the brain develops and functions in physiological conditions? Thanks to modern methods of *in vivo* exploration of brain functioning, we can look for the answer to these questions. In particular, through functional magnetic resonance imaging (fMRI), a non-invasive biomedical imaging technique, we can observe the brain at work and obtain a map of functionally informative brain areas.

Through functional magnetic resonance experiments, we were able to outline the functional topography of the visual pathways in humans. After that the stimulus reaches the primary visual cortex, it is split into two parts. One part proceeds on the ventral way, also called the “what pathway”, through which we recognize the external world. The other part proceeds on the dorsal way, also called the “where pathway”, which is the one allowing us to place objects in space (Haxby et al., 1994). Consequently, if we want to move in the surrounding world, these two areas of the brain must necessarily talk intensely with each other, to be able to recognize the objects around us and place them in the space. In some diseases, e.g., the Alzheimer’s disease, the ability of different areas of the cerebral cortex to communicate with each other is lost even before that focal alterations (that is, to parts of the cortex) occur. This is also known as an alteration of functional connectivity (Grady et al., 2001; Pietrini et al., 1993; Pietrini et al, 2009a).

The ventro-temporal cortex (a small part of the cerebral cortex formed by the ventral part of the temporal lobe) allows us to recognize everything that surrounds us, and to distinguish an object from a face as well as different categories of objects between them. This topic has always fascinated the world of neuroscience, psychology, and cognitive sciences.

In a study published in 2001 (Haxby et al., 2001), we used three Tesla magnetic resonance imaging to understand the neural correlates for recognizing different categories of objects. We examined brain activity in response to visual rec-

ognition of objects belonging to different categories: faces, animals, artificial tools, chairs, places, and everyday objects.

The results demonstrate that the brain response is distributed throughout the entire ventro-temporal cortex, in a largely overlapping manner for all the categories examined. However, the pattern of brain response appears to be highly specific for each category, so much that we can predict, with great accuracy, what the subject is looking at. In other words, there is a very strong correlation in the response within the same category. That is, the response that the brain provides when we look at a face is significantly correlated within the category of faces, but it is not correlated with the response obtained with brain activity related to other categories. Therefore, we can state the existence of a categorical specificity.

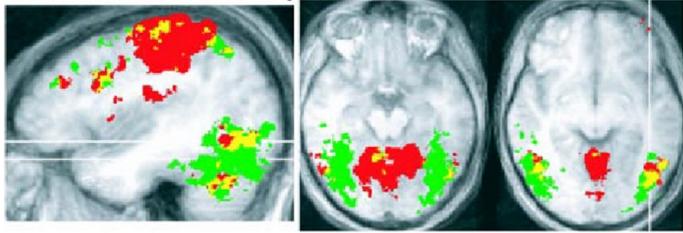
The study by Haxby and colleagues (2001) led to the development of a new model called Object Form Topography. According to this model, the ventral-temporal cerebral cortex does not respond in an all-or-nothing way to certain categories of objects. Rather, it can produce an infinite series of specific patterns of neuronal response. As mentioned above, these patterns are particularly specific and can predict what the individual is looking at. To our knowledge, this is the first study of Brain Reading, addressed to decode a neural signal in such a specific way to be only referable to a specific mental activity.

At this point, a question arises about the conceptual representation: is the functional organization of the cortex only visual or does it represent a more abstract representation of the external world? To test this hypothesis, we conducted a series of functional magnetic resonance studies, in which subjects were blindfolded and were required to recognize objects of different categories, though the tactile (not visual) modality.

Subjects had to perceive objects with their own hands, for example, by touching casts of human faces or other types of objects, such as shoes or bottles. The tactile exploration showed a strong activation, not only of the somatosensory cortex, but also of the ventro-temporal visual cortex, congruently with what happens for visual recogni-

**Fig. 1** The figure shows the areas of the ventral-temporal cortex activated in response to the visual perception (in green) or tactile (in red) of different categories of objects. The areas of the cortex that are activated in response to both visual and tactile perception are reported in yellow (from Pietrini et al., PNAS, 2004, modified).

### Tactile/Visual Overlap



■ Tactile & Visual ■ Tactile ■ Visual

tion. If we superimpose and compare areas activated during visual recognition and those during tactile recognition (Figure 1), we realize that there are areas of the ventro-temporal visual cortex that are activated in both cases.

Several studies show that there is not big difference for the brain between seeing something concretely or imagining to seeing it (Pearson et al., 2015). It follows that, if we touch an object and explore it with our touch, we immediately evoke the visual image of the object that we are touching: this process is called visual imagery (Cattaneo et al., 2008).

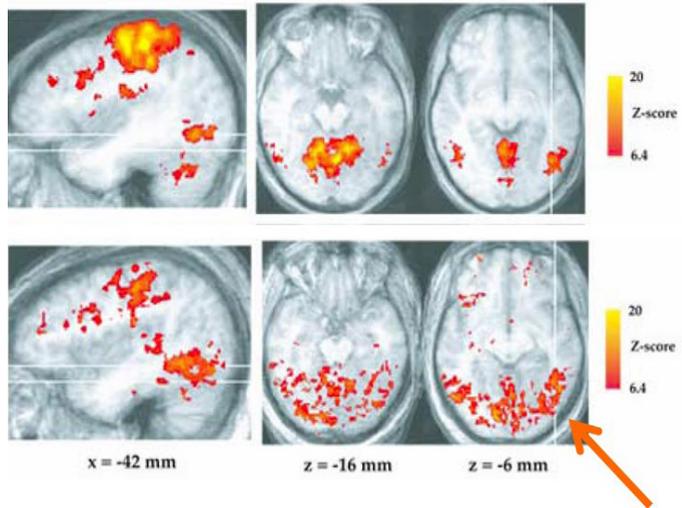
How can we, therefore, exclude that this activation in the ventral-temporal cortex during tactile exploration is not simply due to visual imagery? To provide an answer to this question, we asked people with congenital blindness - who have never seen the world around them and therefore do not have a conceptual representation coming from a visual experience - to recognize objects through tactile exploration.

As shown in Figure 2, the visual cortex of these subjects is activated in the same way and with the same categorical specificity as in the sighted persons, when they see or touch the same object. Given that the congenital blind person has no visual experience and, therefore, no visual imagery, we can reasonably assume that the ventro-temporal cortical activation, occurring during the tactile recognition of different categories of objects, cannot be attributed merely to visual imagery (Pietrini et al., 2004). Therefore, the morpho-functional organization of the ventro-temporal cortex is indepen-

dent of the visual experience. This property has been defined as supramodality, which is the ability to process perceptual information independently from a specific sensory modality (Pietrini et al., 2009b; Ricciardi et al., 2014). Thus, from perception, we move to what could be defined as a conceptual representation. How are concepts related to our surrounding space coded in the brain? We run an experiment in collaboration with scientists on neurolinguistics of the University of Pisa, in which sighted as well as blind from birth individuals were asked to describe the characteristics of different objects. Objects belonged to different categories as mammals, birds, fruits, vegetables, tools, vehicles, natural places, and artificial places. Through a verbal description, it is possible to reconstruct some maps of conceptual representation that group objects together using a property-generation task. These maps are called “behavioral representational similarity maps”. The experiment required that sighted subjects read the name of the referenced object (Verbal Visual Form) or see the image projected (Pictorial Visual Form), or even listen to the name of the referenced object (Verbal Auditory Form). In a time frame of seven seconds, sighted subjects verbally described what they saw or listened to (for example: pineapple: it is a fruit, it is sweet, etc.; cat: is a mammal, meows, has a tail, etc.; bar: it’s a place where you get together, they serve coffee; and so on). Obviously, only the acoustic mode was used for blind subjects, by listening to the name of the referenced object.

These experiments highlighted the link between the spatial representation of the different categories of objects - obtained through the verbalization of the categories - and the possibility of reconstructing the conceptual maps of the objects - based on the patterns of cerebral activation. If we then analyze the whole brain, instead of the visual cortex only, both the correlation and a notable improvement in the segregation between the different objects occurs. Then, a very precise classification of all categories of objects (separated from each other) could be obtained when all the areas that cooperate to this classification are included in the analysis.

**Fig. 2** The figure shows the areas of the ventral-temporal cortex activated in response to tactile perception in visually impaired (above) and blind subjects from birth (below). The arrow indicates the areas of the “visual” ventral-temporal cortex activated by the tactile perception in the blind subjects from birth (from Pietrini et al., PNAS, 2004, modified).



This shows that the conceptual representation of an object of a given category in the human brain is supported by a distributed cortical representation independent from the sensorial modality, which does not differ significantly between those who had a visual experience and those who had not. This representation is also independent from the visual experience and the sensory modality used to collect the information (Handjaras et al, 2016, 2017).

The existence of functional cortical organization, more abstract than what was expected, shows how the brain is programmed to develop independently from the visual experience. It is not yet known how much the brain is genetically programmed and how much it depends on stimuli from the environment, although it is highly probable that the brain needs *some* sensorial experience, anyway. Such an organization allows individuals who are blind from birth to acquire knowledge, to create mental representations, to learn from others and to actually interact with an external world, which they have never seen (Ricciardi and Pietrini, 2011). Thus, the brain can develop its anatomical and functional architecture independently from the visual experience. This can be considered a clear advantage also from an evolutionary point

of view. After the discussion about perception, and after the definition of conceptual representation, it is now time to present the concept of *Imagery*.

#### IMAGES, IMAGERY AND IMAGINATION. CAN THE BRAIN IMAGINE BECOMING AGGRESSIVE?

Using the recent methodologies of morphological and functional exploration of the central nervous system, we can wonder, for example, what happens in our brain when we make a decision, when we interact with others, when we respond to the outside world, or when we become aggressive. From a neurobiological and evolutionary point of view, aggression is the implementation of a behavioral response aimed at benefiting the individual.

A few years ago, we investigated what happens in the brains of healthy young people, who do not have behavioral disorders or a history of violence, when they are asked to imagine themselves in a situation where they must express aggression. Healthy individuals, subjected to Positron Emission Tomography (PET), with marked water to measure changes in cerebral blood flow<sup>1</sup>, had to imagine being in a confined environment (an elevator) with their mother, along with two strangers. On a certain moment, one of the two strangers assaulted the subject's mother, in different scenarios. The subjects had to react thinking to attack this person and beat her, even to the point of killing her (Pietrini et al., 2000). The results of the study showed how, when the individual imagines himself becoming aggressive, his prefrontal cortex is functionally inhibited, in a sort of functional shutdown, that is, deactivated with respect to emotionally neutral conditions. Furthermore, this deactivation was much more significant in females than in males, probably because imagining physical violence is an even more unnatural act for a female than it is for a male. This is congruent to the finding that the scores of aptitude for violence

are significantly greater in males than in females (Figure 3).

These *in vivo* functional data, in agreement with the evidence of clinical literature, demonstrate the importance of the prefrontal cortex in the modulation of aggressive behavior and, more generally, of social behavior and impulse control. The definition of functional neuroanatomy, which underlies the control of behavior, opens the perspective to the study of the brain correlates of criminal behavior. How much is the criminal really free? Or, is that person a criminal because he or she cannot be different from what he or she is (as also summarized in the word game “Bad or Mad” in Anglo-Saxon literature)?

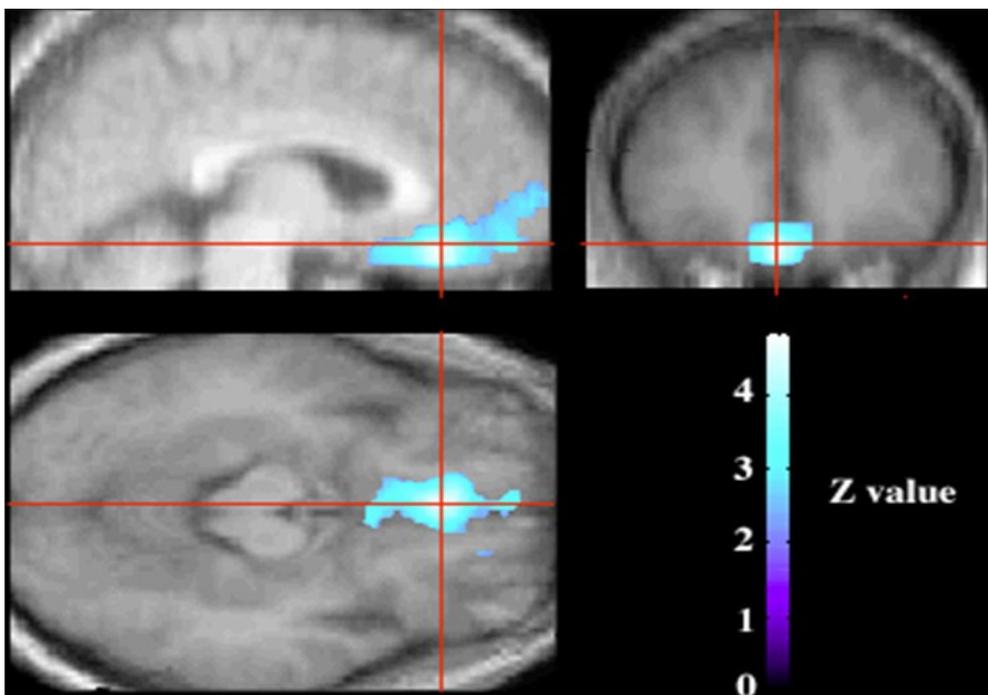
More than a hundred years ago, the English psychiatrist Henry Maudsley (1835-1918), describing criminal psychopaths, wrote: “As there are people who cannot distinguish certain colors by having what is called color blindness, and others who have no ear for music cannot distinguish one musical tone from another, in the same way, there are some that are congenitally lacking of any moral sense”. This is a statement made many years before the advent of any methodology for the scientific investigation of the central nervous system. With the modern methods available, we could nowadays compare healthy non-psychopathic subjects with psychopathic criminals, and we are able to detect the presence of selective anatomical brain differences between the two groups of subjects (Figure 4).

In fact, there is a neuronal reduction that does not concern the whole brain but is only concentrated in the prefrontal cortex and in some areas of the limbic system. It is well known that the prefrontal cortex is important to the control of aggressive behavior and the limbic system to emotional-affective regulation (Ermer et al., 2012). This difference remains statistically significant even when all the possible confounding factors have been taken into consideration, for example: the level of education, psychiatric history, head injuries, alcohol, drug abuse, and so on. Hence, the psychopathic criminals have a prefrontal cortex with significantly

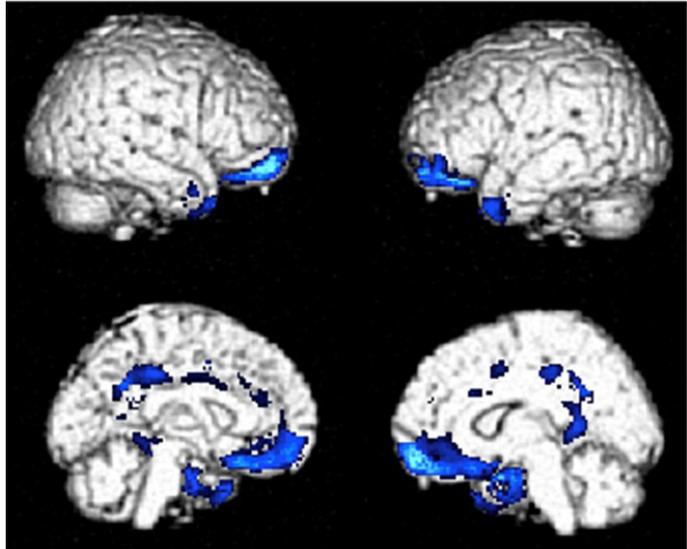
reduced thickness, nerve cells population (over 20% fewer neurons) with respect to control subjects, and with an altered functional connectivity (Ermer et al., 2012; Anderson & Kiehl, 2012; Ly et al., 2012). However, this observation does not tell us whether a) these individuals behave this way because they are criminals, or b) they are criminals because they are like that. In other words, we are faced with the famous egg-chicken dilemma. To understand what is the cause and what is the effect, longitudinal studies are needed on large groups of subjects, starting from the stages of early adolescence. It would be even better to combine these studies with studies on genetic factors that modulate a) vulnerability to the environment in childhood and b) the risk of developing antisocial behavior in adults (Byrd & Manuck, 2014; Caspi et al., 2002; Iofrida et al., 2014 ; Pietrini & Rota, 2013; Rota et al., 2014).

**Fig. 3** The figure shows the reduction in work (in blue) in the areas of the prefrontal cortex of healthy subjects during the expression of aggressive behavior at the imaginary level (from Pietrini et al., PNAS, 2004, modified)

As a conclusion, the long journey in the Imaging Brain Anatomy has begun many years ago with the anatomical studies, in which Italy has been at the forefront. Then, it continued with the possibility to study *in vivo* neuroanatomy with high-resolution, achieving the step of overlapping structure



**Fig. 4** The figure shows the areas of the cerebral cortex with a significant reduction in neuronal density (in blue) in a group of psychopathic criminals concerning healthy control subjects (from Ermer et al., 2012, modified).



and function. Nowadays, it is possible to examine the brain in action while we perceive a figure, represent its meaning, plan a strategy, decide between good and evil. This is a fascinating journey into the brain, in search of the mind. Still, in the hope, which we all look for, of being able to find the crux of the matter about the complexity of the phenomena occurring in our brain (Pietrini, 2003).

## NOTE

**1** Cerebral blood flow is an indicator of brain activity: it increases where brain activity increases and decreases where brain activity decreases.

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# IMAGES, IMAGINATION AND PSYCHOLOGY: A LONG-LASTING LOVE STORY

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## ESSAY 01/01

PSYCHOLOGY  
COGNITION  
IMG  
INTRODUCTION

The present editorial describes the role played by several research fields within the psychological area and suggests reasons why psychological researchers could submit their work to the IMG journal. The contribution of the psychological perspective on the study of images processing and imagination is out of doubt. Subfields like perception and imagery have a straightforward relevance, given that they study how these cognitive processes manage and elaborate external and internal visual stimulation. In addition, other psychological subfields are thought to play an important role because of their tight connection

with perception and imagery. Examples presented in this editorial are memory, language, psychology of thought, planning and cognitive ergonomics, although many other subfields could also show connections. In the final part, the relevance of the IMG journal for cognitive scientists is outlined. The propagation of results from the psychological point of view to design, architecture and education, and viceversa, could stimulate discussion and allow development of reliable ideas. Moreover, the creation of multidisciplinary research projects or groups could help to produce effective outcomes in the society.

When considering the contribution of the psychological fields to image processing, one suddenly thinks about perception and, to some extent, to imagery. Perception of objects, figures, faces, patterns, features (such as colors, distance, size) has been studied in the cognitive fields as one of the most prominent aspects, and cannot miss in every textbook about cognition. The connection between perception and images is obvious, as related to visual aspects of a stimulus: from the early phenomenological studies of the Gestalt, to the cognitive models by Marr (1980) and Biedermann (1987), the visual modality was the most investigated one. Nonetheless, recent studies have focused on other modalities, still relevant for the visual processing of an object: for example, “blind vision” (Cattaneo & Vecchi, 2011), supramodal processing areas (Ricciardi et al., 2011) and imagery (Ganis et al., 2000). While perception would require an object, imagery has been defined as a flow of thoughts involving senses to an extent that mimic the perception of a real object, but being still considered a product of the mind from the person. After periods of embargo from psychological investigation, its impact is now out of doubt: imagery is relevant for the elaboration of motor responses (Wolpert & Kawato, 1998), whose output is compared to the perceptual feedback and guides behavior. Moreover, it plays a key role in a wide range of psychiatric disorders including schizophrenia, anorexia, post-traumatic stress disorder, depression and obsessive-compulsive disorder (Pearson, et al., 2015). Likewise, some proposal for the treatments of clinical diseases (Holmes, et al., 2011) and for education of problematic children (Dowrick, 2012), mainly based on imagery, have been suggested. For these reasons, the IMG journal would expect a rich contribution from researchers in perception and imagery, which could improve and deepen the work in design and education.

Actually, both perception and imagery do not process stimuli as isolated modules, and require contribution of other mechanisms. Memory, in particular, is tightly connected to both. To the one hand, the visuo-spatial sketchpad of the

working memory maintains active and manipulates a set of conscious visual images (for a deep discussion see Pearson, 2001). Its role consists in providing people with the possibility to further explore visual and/or spatial information, without interfering with the verbal system. Accordingly, imagery and imagination (the difference between these processes is described in Vecchi, 2019) can be processed autonomously with respect to the verbal material: for example, after seeing a painting, one can retain its details even though she cannot find the words to describe these details. To the other hand, past experience is populated of visual memories. More or less vivid excerpts of life are able to activate related emotions: namely, episodic long-term memory. Prototypical images or schematic diagrams may be helpful when dealing with problems to be solved or when a quick answer should be given: that is, creating associations and retrieving information from the semantic memory. The mechanisms of memory have been studied extensively, and the amount of data about effects and effective strategies is a valuable resource, in my opinion, for those having the goal of creating a campaign that people would remember for many years.

The relationship between images/imagination and language and psychology of thought is generally considered to be less congruous with respect to the previous fields but, analyzing some peculiar aspects, it is still relevant indeed. In both processes, they work as facilitator. Imagination helps the creation of original discourses by combining structures into smart utterances. As related to the psychology of thought, when a schema is not suitable to achieve the solution, a problem solving process need to start and imagination could help to combine other heuristics or to ideate new strategies to fulfil the task (Treffinger, 1995). As regards to the role of imagery in these two processes, among several examples I would like to highlight its relationship with planning. Imagery plays a fundamental role for planning, because it allows foreseeing both the course of action to be executed and its consequences, and provides a sense of reality to the

plans. Therefore, imagery contributes to the creation of feasible predictions, fundamental both for language processing (Pickering & Garrod, 2013) and for problem-solving and decision making (Benoit, Gilbert & Burgess, 2011).

The last psychological field that I consider relevant mentioning is cognitive ergonomics. It investigates the relationship between human people and their work, by examining the interaction of cognitive processes with physical objects (Hartson, 2003). For example, it concerns controls and organization of displays (mapping); materials and their affordances; how colors, shapes and sounds may be properly used to increase efficiency of interfaces. Can one effortlessly identify what the icons of the buttons of a remote commander indicate? How could one evaluate whether children could use a didactical (video-)game and be enjoyed at the same time? Cognitive ergonomics (also known as human factors) merges the application of findings from the psychological studies with measurement and evaluation of human artifacts, originating a peculiar approach (Wilson, 2000). This aim is shared with the IMG journal, and this specialty evidently creates a bridge between psychology and the other disciplines collaborating to this editorial project.

The contribution of the areas described above to the discussion raised with IMG was an easy task to be fulfilled, because their impact is straightforward. The propagation of results from the psychological point of view to design, architecture and education could stimulate discussion and improve development of reliable ideas. Therefore, many readers of IMG would show interest in reading articles coming from the psychological perspective. Notwithstanding, why should a psychologist find interest in publishing a paper on IMG? From a raw perspective, if results will circulate in other fields, dissemination and citations of the papers would be improved. Thus, citation index would benefit and would count, in these times when these stressful indices are measured. More importantly, in my opinion, two other consequences are expected. On the one hand, psychological re-

search could borrow experience from other fields to develop original ideas on aspects that are not considered central, yet. This would guide psychological fields toward different interpretations of new and old data and, consequently, to the adjustment of theoretical models to include complementary perspectives. On the other hand, the creation of multidisciplinary research projects or groups, dealing with concrete tasks, could produce effective outcomes in the society. For these reasons, I warmly invite psychological scientists to submit their work to IMG, which is expected to become a reference point on the boundary between research disciplines.

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**“ANTE LITTERAM”  
HYPER-DRAWINGS**  
MARGINAL NOTES  
ON THE APPLICATION  
OF PROLEPTIC  
ABSTRACTION  
IN THE HISTORY OF ART  
AND ARCHITECTURE

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## ESSAY 02/01

PROLEPSIS  
REPRESENTATION  
COMMUNICATION  
HYPER-DRAWINGS

Although proleptic abstraction is a distinctive characteristic of literary art (and of rhetorical art in particular), it also had profound effects on the history of the figurative arts. This is especially relevant with regard to the classical and medieval ages when it rises to the rank of a consolidated representative technique. The term *prolepsis* (from the Greek *prólepsis*, derived from *prolambánō*: "I take first"), signifies a specific instrument of descriptive manipulation which, by subverting the actual space-time distances, permits the anticipation of what in reality, according to an orthodox logical/syntactical scheme, should follow or which, in any case, could not be reasonably perceived

because it is otherwise located. It is no coincidence that the artists of the past seem to have employed prolepsis on the occasions when they intended to subordinate the naturalistic exigencies to the content and/or didactic objectives. That is, whenever they sought a more dynamic and open expressive means, having perceived the limits that are implicit in a two-dimensional representation.

Proleptic representations summarise both qualities, because they are in fact true and proper "ante litteram" hyper-drawings which, not by chance, have been recovered and re-invented by contemporary architects most suited to communicative experimentation.

At least until the end of the fifteenth century, the history of art was marked by the use of proleptic abstraction. This use occasionally bordered on the limits of abuse. The term *prolepsis* ("from the Greek *prólepsis*, derived from *prolambánō*: "I take first") (*Dizionario di Retorica e Stilistica*, 1995, p. 297), signifies a specific instrument of descriptive manipulation which, by subverting the actual space-time distances, permits the anticipation of what in reality, according to an orthodox logical/syntactical scheme, should follow or which, in any case, could not be reasonably perceived because it is otherwise located (Giordani, 1973-1974, p. 225). "When halfway through a speech one remembers the end, and recounts it; like in the beginning of *The Iliad*, Book XXIV, which speaks about the destruction of Troy and the death of Hector which have not yet taken place" (Ferri, 1948, p. 61). Or as seen in verses 91-92 of *Le Ricordanze (Memories)* by Giacomo Leopardi (*Death is the one / that advances towards me with great hopes today*), "where anticipation puts 'hope' in a position of strong contrast with 'death', demonstrating the collapse of the poet's illusions, to which nothing remains but to hope for death to put an end to his suffering" (*Dizionario di Retorica e Stilistica*, 1995, pp. 297-298). As well as the existence of three proleptic incipits used to great narrative effect, firstly in *The Death of Ivan Ilyich* by Lev Tolstoj, which opens with the epilogue of the protagonist's history, namely with his death, in *The Baron in the Trees* by Italo Calvino, which reveals Cosimo's decision to spend his life in the trees without ever descending to ground level, and in *One Hundred Years of Solitude* by Gabriel Garcia Márquez, who anticipates Colonel Aureliano's fatal destiny.



**Fig. 1** Roman imperial coin of the age of Maxentius, verso (307-312 A.D.).

Moreover, although proleptic abstraction is a distinctive characteristic of literary art (and of rhetorical art in particular), it also had profound effects on the history of the figurative arts. This is especially relevant with regard to the classical and medieval ages when it rises to the rank of a consolidated representative technique (Ferri, 1948, pp. 61-80; Robert, 1975). It is no coincidence that Silvio Ferri, when referring to the "primitive" desire to amplify narrative clar-

ity beyond the limits imposed by spatial-temporal truthfulness, notes that, for many centuries, this desire was actually resolved in the representation of “distant, hidden, or future objects [...], pregnant women depicted with a visible foetus in the womb, fish with a small fish already formed in the belly, or even where the fishbones can be seen, people carrying out the housework inside houses who are visible, because it was as if the walls had disappeared, shoes that let you see the outline of the shod feet, riders with both legs visible – even those beyond the horse’s flank – elephants with traps already depicted on their bodies in which it was hoped that someday they would fall, as if by magic, bisons and felines with entire arrows drawn on their bodies, wagons seen from above with each ox viewed from the side”. These images “not only depict the consecutive stages of an action but even those which, if not through an interposed diaphragm, would be humanly possible to see” (Ferri, 1948, pp. 61-62).

Upon closer examination, proleptic abstraction distinguishes much of the history of classical art: from the Haterii



**Fig. 2** Giotto da Bondone,  
*Natività di Maria*, 1303-1305  
(Padova, Cappella degli Scrovegni).

sepulchral monument (in which the ajar position of the *Porta Inferi* (*Gateway to the Underworld*) indicates that the scene represented actually takes place inside the monument) to the side of an imperial coin from the age of Maxentius (in which the neat rhythm of the temple's columns is spread out to glorify the personification of Rome). Furthermore, proleptic abstraction continually articulated milestones in the history of medieval and Proto-Renaissance art. There are numerous and varied examples.

In the mosaic of the Cathedral of Santa Maria Annunziata in Otranto (1163-1165), the final configuration of the Tower of Babel is anticipated in the lower part, where a number of master masons are still busy constructing the entrance arch and preparing the necessary blocks for the mighty wall sub-structures.

In the *Natività di Maria* (*Nativity of Mary*) by Giotto (1303-1305), a woman is depicted on the doorstep, giving the mid-wife cloths that are necessary for childbirth. Meanwhile, in the scene represented in the inside section, Saint Anne can be seen extending her arms towards the newborn wrapped in the same cloths.

In the *Ultima cena* (*Last Supper*) by Pietro Lorenzetti (1310-1320), viewers can glimpse the servants feeding left-over food to the domestic animals in the kitchen by virtue of the contrived transparent wall.



**Fig. 3** Maso di Banco, *Miracolo di San Silvestro*, c.1340 (Firenze, Chiesa di Santa Croce, Cappella Bardi di Vernio).

In the *Miracolo del bambino caduto dalla culla* (*Miracle of the Child Who Fell Out of His Crib*) by Simone Martini (c. 1330), the three phases of the story are summarised in a single picture: the death of the child who fell from his crib, the miraculous intervention of the Blessed Agostino Novello and, finally, the procession of thankfulness by the faithful.

In the *Miracolo di San Silvestro* (*Miracle of Saint Sylvester*) by Maso di Banco (c. 1340), the magicians appear twice, firstly deceased and then, clearly subsequently, resuscitated.

In the *Danza di Salome* (*Dance of Salome*) by Benozzo Gozzoli (1461-1462), the three phases of the story, namely the dance of Salome in the presence of Herod, the consequent beheading of John the Baptist and the delivery of the macabre trophy to Herodias, are composed, both spatially as well as temporally, in a single image.

In the *Polittico di Sant'Emidio* (*Saint Emidio Polyptych*) by Carlo Crivelli (1473), the figure of the Madonna enthroned with the Divine Child is dominated by the image of the Pietà, which casts a tragic shadow over Mary's motherhood.

In the *Madonna con Bambino* (*Madonna and Child*) by Francesco Bonsignori (1483), the depiction of the sleeping Jesus as an infant, lying on a red-veined stone bed, conceptually unites birth and entombment.

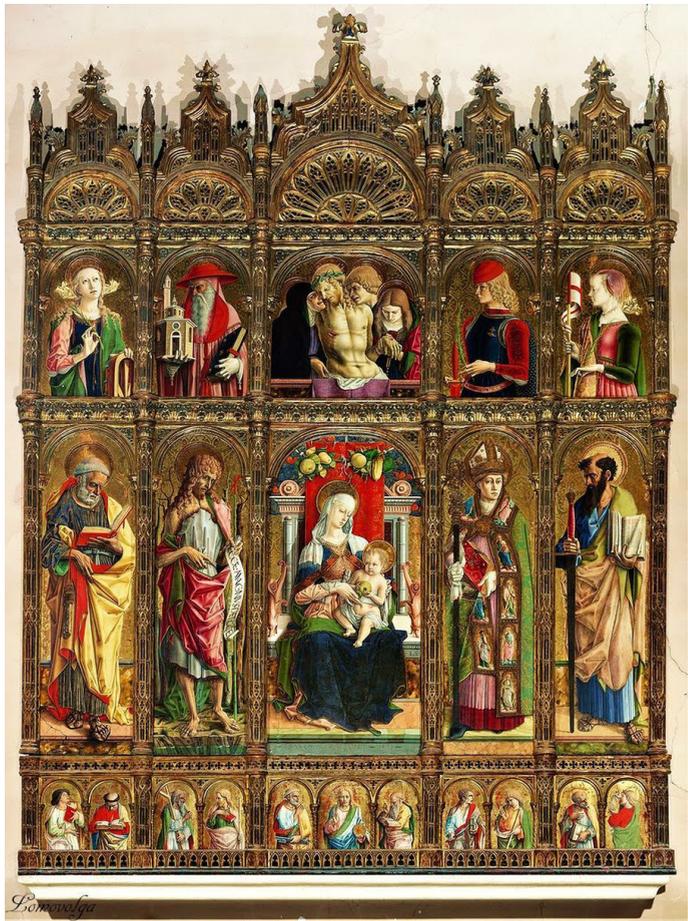
In the *Sposalizio della Vergine* (*Marriage of the Virgin*) by Pietro Vannucci (1501-1504), the ceremony actually takes place



**Fig. 4** Benozzo Gozzoli, *Danza di Salome*, 1461-1462 (Washington, National Gallery of Art).

inside the temple represented *mise en abyme*, from which it is transposed to the exterior to render it visible.

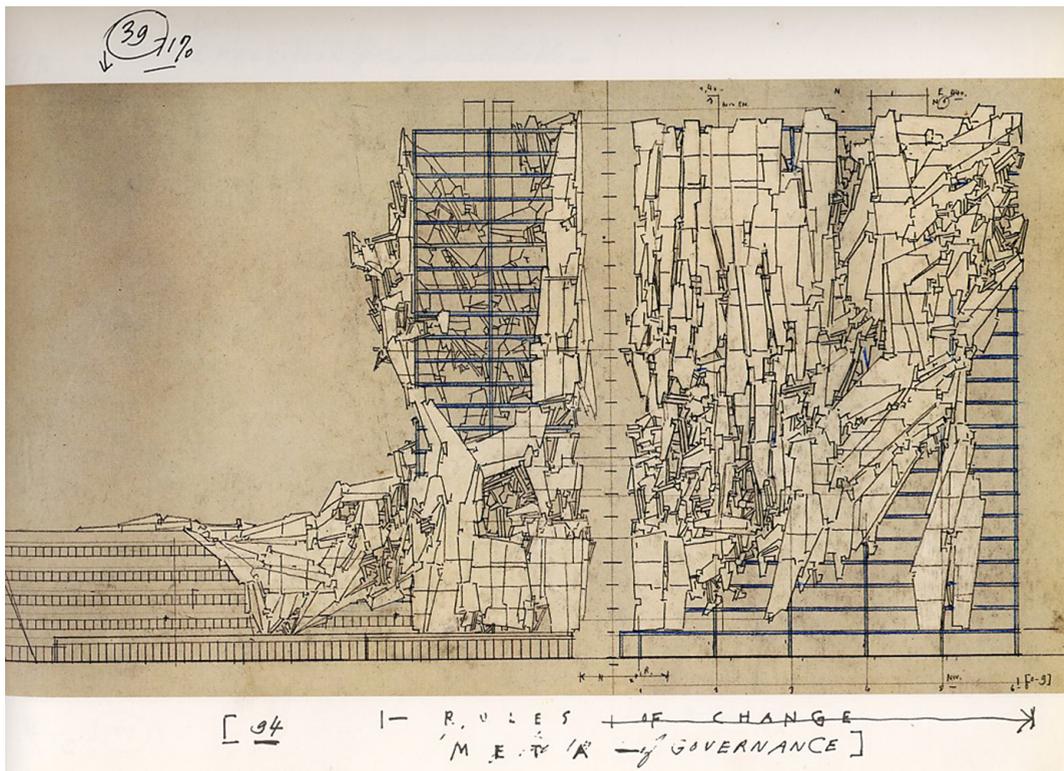
The analysis of these examples (the list of which is long but not exhaustive) calls for a series of reflections. First of all, it is evident that proleptic abstraction was always pursued by means of precise representative stylistic elements which, although never codified, are consolidated by the recurrence of use: *semae* or *argumentum* that have proven efficacy, introduced with rituality in the different compositions in order to suggest the correct interpretation of the images to the viewer. These stylistic elements generally consist of curious architectural deconstructions, figures portrayed through windows



**Fig. 5** Carlo Crivelli, *Polittico di Sant'Emidio*, 1473 (Ascoli Piceno, Cattedrale di Sant'Emidio).

or intent on crossing the doorway of a building and, above all, through parted curtains. Two works by Piero della Francesca are exemplary in this regard, including the *Sogno di Costantino* (*Dream of Constantine*) and the *Madonna del Parto* (*Madonna of Parturition*). These works feature curtains which serve to indicate that the two otherwise non-essential images hold meaning according to future events (respectively, Constantine's victorious battle against Maxentius and the birth of Christ the Saviour). The stylistic feature of the raised curtains, which in itself refers to the primitive theatrical system of the moveable drapes, which had certainly "accustomed the spectators' eyes and minds to a proleptic interpretation" (Ferri, 1948, p. 74) of the events represented. In relation to the architectural elements, within which the narrated events take place, the way in which figures are juxtaposed oscillates substantially between two typical solutions: the transposi-

**Fig. 6** Lebbeus Woods,  
*War and Architecture*, 1993.



tion of the figures to the outside, depicting the buildings that contain them in the background, and the preservation of the interior setting, making the outer walls transparent.

Nevertheless, the artists of the past seem to have employed prolepsis on the occasions when they intended to subordinate the naturalistic exigencies to the content and/or didactic objectives. That is, whenever they sought a more dynamic and open expressive means, having perceived the limits that are implicit in a two-dimensional representation. Proleptic representations summarise both qualities, because they are in fact true and proper "ante litteram" hyper-drawings. It is not surprising to find very few examples of proleptic representations after the fifteenth century (perhaps the caprices by Canaletto, probably the prisons painted by Giovanni Battista Piranesi and, at most, the aeropaintings by Gerardo Dottori). It is necessary to go as far as the contemporary and, in particular, up to the sophisticated sketching virtuositities permitted by the advent of computer graphics in order to trace an equal space-time licentiousness. A long list of graphic works that, from the "catastrophic pre-visions" of Lebbeus Woods to the "conceptual space" of Peter Eisenman up to the "simultaneous visions" of Zaha Hadid, tend to overflow from the margins of traditional antinomies (before/after, above/below, front/back, inside/outside), flaunting a narrative anachronism that betrays a veritable narrative impatience (Eco, 1994) and that disputes in itself the representative certainties inherited from almost four hundred years of latent classicism (Eisenman, 1992).

## NOTES

**1** “In classical rhetoric, prolepsis consists in preventing, refuting, the possible objections of the speaker or, in any case, in making an event contemporary with an action that, in reality, is the product of the action itself; while, in the literature in general, prolepsis means the placement of one or more words before the order required by the ordinary construct”. Instead, the linguistic prolepsis consists in the “anticipation, under expressive or affective stimulus, of a part of the preposition or of the period that according to the normal (pseudological) type of discourse should be placed in the posterior position” (*Grande Dizionario Enciclopedico*, 1960, p. 508). In this regard, see also Genette, 1972.

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# **BORDERS** CHILDREN'S LITERATURE AND ITS INTERSECTIONS

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## ESSAY 03/01

CHILDREN'S LITERATURE  
PICTURE BOOKS  
IMAGINARY  
SILENT BOOKS

Children's literature travels from one era to another, from one age to another (from early childhood to early adulthood), overcoming boundaries thanks to the many translations, while it is crossed by several genres and is contaminated by them. For a long time, children's literature has been combined with the creation of metaphors. Childhood metaphors that represent the best way to

penetrate and investigate the shadowlands of the childhood universe beyond the thick and homologating mist that makes it invisible. In particular, the picture books, of which the wordless or silent books represent the most innovative aspect, are considered the main instruments in children's literature for the stunning aesthetic quality that connotes them.

Entering the plurality of interpretations that children's literature contains is an exciting undertaking, full of cognitive surprises and profound references to the world of the imaginary. In fact, it contains a large communicative universe with open borders, capable of making original connections with other disciplines and offering immense potential to the scholar's eyes.

From the indispensable historical context to the more strictly literary context, from the iconological field to the new frontiers of cross-media and to the changes in the recipient's multi-faceted figure –the child reader– children's literature is characterized, for its own interpretative vocation, as a varied, complex sector, a *border country* according to Peter Hunt's definition, open to new combinations and multiple ramifications (Hunt, 1991). Substantially intertwined with the cultural history of childhood, its image and its relationship with the adult world, children's literature travels from one era to another, from one age to another (from early childhood to early adulthood), overcoming boundaries thanks to the many translations, while it is crossed by several genres and is contaminated by them: from fable to adventure, from detective story to horror, from science fiction to fantasy without forgetting poetry and the 'instructive' novel. For a long time, children's literature has been combined with the creation of metaphors, representations, themes and narratives that branch into cinema, theater, art, media, although it is rooted in the production of books for childhood. In fact, stories for children and teenagers, from the classics to the current and very important editorial growth that has conquered many readers, are a mirror with many facets reflected in all the media. Orality, writing, illustration, animated drawings, films and interactive media, while adopting different codes, participate in the same narrative dimension, creating a continuous renewal of the imaginary.

Therefore, the lens of complexity is indispensable for identifying a sort of fil rouge that connects many languages on the different bookshelves of children's literature and to decipher,

by means of new instruments, the representation of an often invisible and unknown childhood universe to which quality children's books lend a voice and provide expression.

However, a profound ambivalence, crosses children's literature poised between the audacity of its symbols and the subtle desire of control coming from the adult world. Every artistic language is exposed to control systems, but children's literature suffers more than others because the stakes are higher and it regards an age group, i.e. childhood, invested with social expectations and attempts at modeling, a menace forever lurking in the background.

The shackling of the genre that undergoes different declinations over time (from the censorship and the didactic norms of the past to the current invasive commercial canons) always risks creeping in for the most authentic nature of children's literature is able to probe the child's otherness without denying it or homologating it into conventional proposals. The scholar's objective is to bring to light the quality of a rich and complex production notwithstanding the intrusiveness of the publishing market, enhancing the bold and creative experimentation of new languages capable of penetrating, by means of original "childhood metaphors," the more secretive nooks and crannies of childhood experience, narrating its most intimate and profound experiences.

Childhood metaphors that represent –thanks to the “poetics of the point of view”, the child's gaze, the engine of the story, masterfully dilated and situated in the foreground– the best way to penetrate and investigate the shadowlands of the childhood universe beyond the thick and homologating mist that makes it invisible. The meaningful scenarios that spring from these explorations find a privileged channel in the illustrated books with which to grasp the otherness of a child-like world which can be offered new possibilities of vision through an authentic education of the gaze.

Today, the picture books, of which the wordless or silent books represent the most innovative aspect, are considered the main instruments in children's literature for the stunning

aesthetic quality that often connotes them together with the charm and the strong appeal exerted upon the readers. The complex poetic form enclosed within the apparent simplicity of the illustrated books, the multiplicity of references (i.e. painting, cartoons, photography, cinema, music) that flow into the narrative language of picture books, puts them at the center of a rediscovery of studies that have become ever livelier thanks to the new perspectives that have developed in the field of illustration.

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# **THE VISUAL BRIDE:** REPRESENTING TANGIBLE HERITAGE BETWEEN DIGITALITY AND REAL CONTENTS

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## ESSAY 04/01

BUILT HERITAGE  
DIGITAL HERITAGE  
DIGITAL CULTURE  
DIGITAL MODEL  
VISUAL TURN

Aim of the paper is to reflect on the visual relationships between the digital heritage from real contents and its tangible reference. First of all the paper analyses the evolution of the Culture in relation to the growth of digital technologies. Then it highlights the role of visual perception and commu-

nication. Consequently, it focuses on the nature and characteristics of digital models, intended as complex meta-systems of information. Finally, it points out the multiple dimensions of tangible and digital realities, and how advanced visualizations favour a reciprocal re-mediation.

The title of the paper paraphrases the one of the well-known essay “The Mechanical Bride” (1951) by McLuhan. It was an anthropological reflection on how the tele-vision medium influenced the culture and related behavioral models. Many years have passed, and subsequent cultural and technological revolutions have influenced the way of living and thinking, perhaps even more pervasively, according to a line where the “Digitality” –using the wording diffused by Negroponte (1995)– has certainly constituted a substantial turn. The so-called “digital culture” cannot simply be referred to a discrete data systems or to the use of computers, but to a universe of experiences: technological aspects, virtual processing, forms of instant communication, social media that in a global and ubiquitous way define a large part of our life (Gere, 2002, p.11).

From the 60s, the technological innovations in data transmission, visualization and development of computing capabilities have focused attention on the dimensions of “Virtual Reality” (Sutherland, 1965). Often this term is used in opposition and in alienation from the Real: VR is both an enthusiastic and dystopian vision where the cyberspace enhances our potentialities, and compresses space and time in the “immediate use” of the information. In particular, following the diffusion of personal computers and video games between the 70s and 80s, the “Virtual” has become a trend topic, even in popular culture, as evidenced by the numerous publications on this subject (just to mention a few publications Krueger, 1991; Rheingold, 1991; Benedikt, 1992). In parallel, on an opposite but conceptually related front, there are the experiences of telepresence based on remote sensing and data transmission, where the operator interacts with a reality located away from him, through a two-way virtual repetition (Fisher, 1985).

Meanwhile, cultural considerations on possibilities induced by the Digitality have been developed in many fields (Barret, 1992; Feenberg & Hannay, 1995; Floridi, 1999; Ware, 2000). The reflections on how the “Digital”

re-medializes the communication processes are of particular interest, according to new and multiple multimedia, multidirectional, non-linear, interactive, and ubiquitous communication modalities (Murray, 1997; Bolter & Grusin, 1999; Manovich, 2001). Virtual Reality, Telepresence, Augmented Reality blur in new advanced ways of representation. The term “Mixed Reality” – created by Milgram and Kishino (1994) to describe the different states that digital representation can take in the “virtual continuum”, according to six main states between the “only real” and “completely virtual environments” – gains more and more importance.

Unthinkable new dimensions of ICT and A.I. Artificial Intelligence boost the potentialities of The Internet, so that smart devices immerse us in a constant and ubiquitous on-line state (Floridi, 2015), where computational barriers are almost canceled, and “Participatory Culture” expressions take on central importance (Jenkins, 2006; Jenkins, 2009). In particular Jenkins (2009) highlights how the questions posed by participatory culture are essentially cultural issues and not merely technological ones: “The importance of culture’s complex relationship with technologies is why we focus in this paper on the concept of participatory cultures rather than on interactive technologies. Inter-activity is a property of the technology, while participation is a property of culture” (p. 8). The processes of collection, digitization, sharing, remediation, processing of data and information favor forms of “Collective Intelligence”, based on a multitasking cognitive approach. Follows that the culture-making configures no more like a linear process but as a complex evolving discourse. In the networked society, consumers have become active content producers, according to new kind of media (Lévy, 1994). It is the so-called “Second Digital Turn” (Carpo, 2017) which involves both the tangible and intangible sphere: trade, industry, tourism, culture, everyday life. Where the user becomes the

protagonist and the digital production individualizes the products.

The above mentioned scenario might seem to outline what described by Baudrillard (1976), with the reality under the threat of simulations: the “Hyperreality” as a re-duplication of the Real, where the Real at the same time evaporates but also becomes stronger in its own destruction, in a fetishism of lost objects, in an ecstasy of negation, in an overall loss of meaning. But in our Post-Digital age, despite the pervasive, instantaneous and ubiquitous applications of VR, AR, and ICT, the “new spectacular” by Virilio (1993) does not seem to have had the predicted extreme nihilistic outcomes, although not denying the fact that we are often “overexcited” “victims of the scene”, because visualization technologies influence our culture, our way of thinking and acting.

Perhaps what has already been predicted by Baudrillard in the title of his work (“L’échange symbolique et LA MORT” ) has come true: the closed and self-referential system of Hyperreality died, because it imploded, killed by the disenchantment of post-modernism. The emptiness made by the Hyperreal around the Real has been filled by an ontological return to the “physical” and to the “material”. It is the philosophical line of the “New Realism” (Ferraris, 2011): without prejudice to the lesson of post-modern and hermeneutics, it focuses on the observation of reality as an effective presence, based on a re-evaluation of the role of Perception: “In a certain sense, the function of perception is similar to the falsification in Popper, only that here it performs an ontological function and not, as in Popper, an epistemological one” (Ferraris, 2012, p. 154). The perception is proposed as representative of an “external” with which the viewer has to confront.

Moreover, a constant re-appropriation and re-valorisation of the “Visual” seems to outline the whole technological growth. Many times during centuries, media renewed the relationship between people and “images”,

but today digital technologies profoundly influence it (Mitchell, 2017. Purgar, 2017). It is the “pictorial turn” (Mitchell, 1994) that does not oppose a visual paradigm to a verbal one, but considers their semiotics in a con-substantial way. There is a change of perspective in the visual disciplines according to a re-thinking of the post-modern “linguistic turn”: an “iconogical” parallel reading of “images” and “logos”, in a non-conflictual interpretation but in a cohabitation (Mitchell, 1986) of “mixed media”.



**Fig. 1** S. Giovanni Battista Convent in Lucoli (IT). Digitalization of the architectural complex.

This long introduction is useful to frame the theme of Digital Heritage from Real Contents (Nofal, 2019). The “Charter on the Preservation of the Digital Heritage” (UNESCO, 2003) ratifies the role, dignity and importance of digital tools and methods in the creation of cultural heritage at the international level: “The digital heritage consists of unique resources of human knowledge and expression. It embraces cultural, educational, scientific and administrative resources, as well as technical, legal, medical and other kinds of information created digitally, or converted into digital form from existing



**Fig. 2** Exploring the point cloud.

**Fig. 3** Surfing between raw data.

analogue resources” (Art.1). Unlike Stone’s (1999) definition of “Virtual Heritage” – i.e. “the utilization of technology for interpretation, conservation and preservation of Natural, Cultural and World Heritage” –, in the Charter the Digital Heritage tends to assume an independent connotation and value. Focusing on digital heritage from real contents, the digital objects assume a new meaning of “real”, “but conceptually this meaning derives from the active relationship with the physical content, from which it derives. In this kind of digital heritage, there is not visualization without a prior reality and, in a philological study of a digital model, we cannot forget its real reference from whom it is born. Therefore, the issues related to data and information grow to include the relationship with

history and materiality” (Brusaporci, 2017a, p. 56).

In general, Digitality roots on hypertexts, that is on network open systems of delocalized information grains, instantly accessible, where the concepts of unity, identity and localization vanish. This involves new ways of fruition where the act of “reading” merges with “writing”, because it consists in traveling freely over the hypertext, each time giving rise to new systems of signs and to new interpretations: the meaning of the text emerges from the intersection between a de-territorialized semiotic plane and the line followed by the reader. But in the Built Heritage we have a material constraint: the “hic et nunc” of the Real. In Built Heritage, there is not visualization without a prior reality (Ch’ng, Gaffney, & Chapman, 2013; Ch’ng, Cai & Thwaites, 2017), and in a philological study of the model, we cannot forget its real reference from whom it was born.

Focusing on the topic of Built Heritage, in particular archeology immediately interested in the subject of 3D modeling as an effective tool for virtual reconstruction and research methodology (Forte, 2000; Forte & Siliotti, 1996; Frischer, 2008; Forte, 2008). From these experiences rises “The London Charter” (2009), addressed not only to archeology but to all disciplines interested in 3D models from tangible heritage. Fundamentally, it is aimed at defining the principles of scientificity and validation in the virtual reconstruction of cultural heritage, where the concept of Transparency and the use of Paradata are references for the philological analysis of the digital models, referred to the real findings or documents (Bentkowska-Kafel, Denard & Baker, 2012).

More generally, an interesting dissertation on the concept of Built Digital Heritage is presented by Pescarin (2016) which analyzes the wording “Digital” + “Heritage” in the light of “Digital Heritage Congresses” experiences. She points out: “Which trends can be recognized, looking at this overlapping area, which is Digital Heritage, through presented projects and demonstrations? One of the first element to appear is

the position of the 'human dimension', considered more and more a key element. Heritage professionals necessities are better taken into consideration, from digital projects early stages; end users, such as visitors of museums, tends to be involved in some cases during the planning phase. The 'wow' effect of ICT technologies for heritage researchers, practitioners and curators is now diminishing, while the sustainability of digital projects and their effectiveness as referred to a specific goal, in constantly increasing. The role of design and co-creation is emerging [...], filling the gap among audience,



**Fig. 4** Palazzo Camponeschi in L'Aquila (IT). The 3D model.

developer and heritage curator. The role of 'narrativity' is also considered as important as the coding, for the success of a digital heritage project [...]. Mixed digital outputs (i.e. serious games including short movies, VR immersive applications that includes passive and active moments, etc.) are experimenting different levels of user interaction and involvement, while trying at the same time to find and define new communication styles and approaches, since the traditional proved to be unsatisfactory [...]. Finally, most of the projects have demonstrated a high interest toward the quality of user

involvement, a topic currently under investigation from different perspectives” (p.3).

Moving to the field of architectural heritage, 3D scanning tools and advanced modeling programs have encouraged reflections on modeling as instruments for visualizing, enhancing, designing, and enhancing new methods of analysis (Chiavoni & Filippa, 2011; Brusaporci 2015a; Brusaporci 2016). In a peculiar way, the AEC sector holds two important revolutions: the one of Building Information Modeling – HBIM when referred to historical buildings (Brusaporci, Maiezza, Tata, 2018a; Mingucci et alii, 2016) –, and the one of parametric modeling related to visual design (Brusaporci, Maiezza, Tata, 2018b; Calvano 2019). The issues of Transparency and Reliability of the model with respect to the real referent are essential, according to both metric-informational and conceptual issues (Brusaporci, 2017b; Maiezza, 2019).

With reference to the Architectural Survey, the traditional surveying process changes: the digitization phase is anticipated and the critical interpretative processes are translated into the post-processing (Docci & Maestri, 2009; Gaiani, 2012a; Bianchini, 2014). Above all, the nature of the restitutive

graphic changes substantially: the digital model configures as an information system, primarily of a spatial nature (3D model), but also of material, historical, construction, economic nature. In short, the model becomes a spatial platform for database management. As our relationship with technology changed over the years, so the relationship of the modeler/user with the digital model is changing: no longer a cultural and aesthetic interest in images of simulacra, but an “anatomical” attitude to the system, an “obscene” X-rays look to the complexities of data interactions and information. In this way, the gaze moves from the observation of synthesis render to the interactive working interface, where models are processed, where there is a live interaction with and between users and computers. In this place, data becomes information, and information becomes

knowledge. This is the place of the “master model”, where the model is computed through graphic systems. In this sense the master model is a “Meta-Model” of information from which to derive infinite multimedia views (Gaiani, 2012b; Brusaporci, 2015b). It is a truly “Virtual” digital model in the sense of Lèvy (1995): starting from a reserve of initial data, from a model or from a meta-text, an infinite number of events can be processed, always different depending on the situation or user demands. On the display, the user experiences the new plasticity of the re-mediated text, through a selection, re-edition,

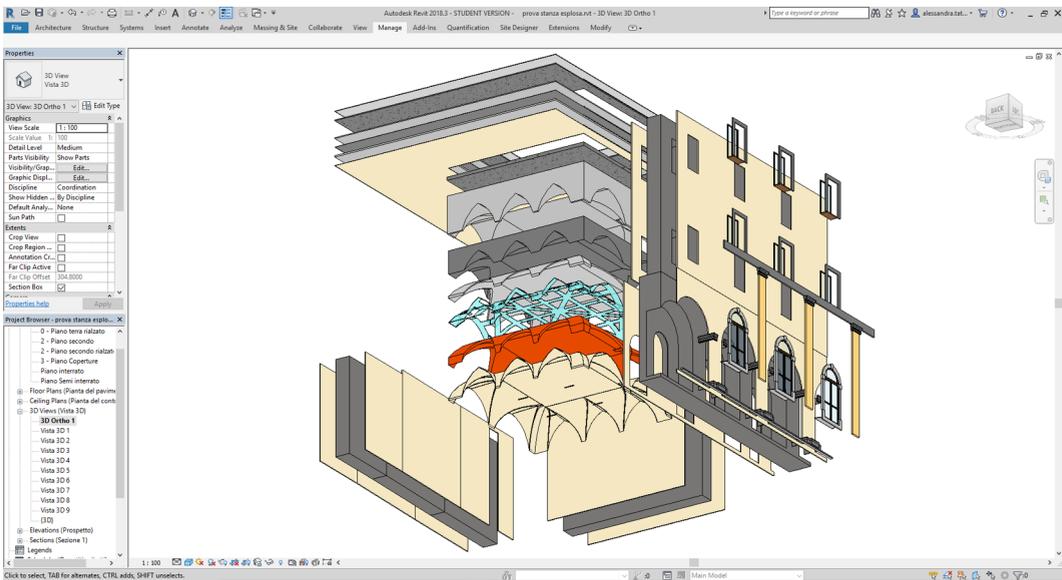


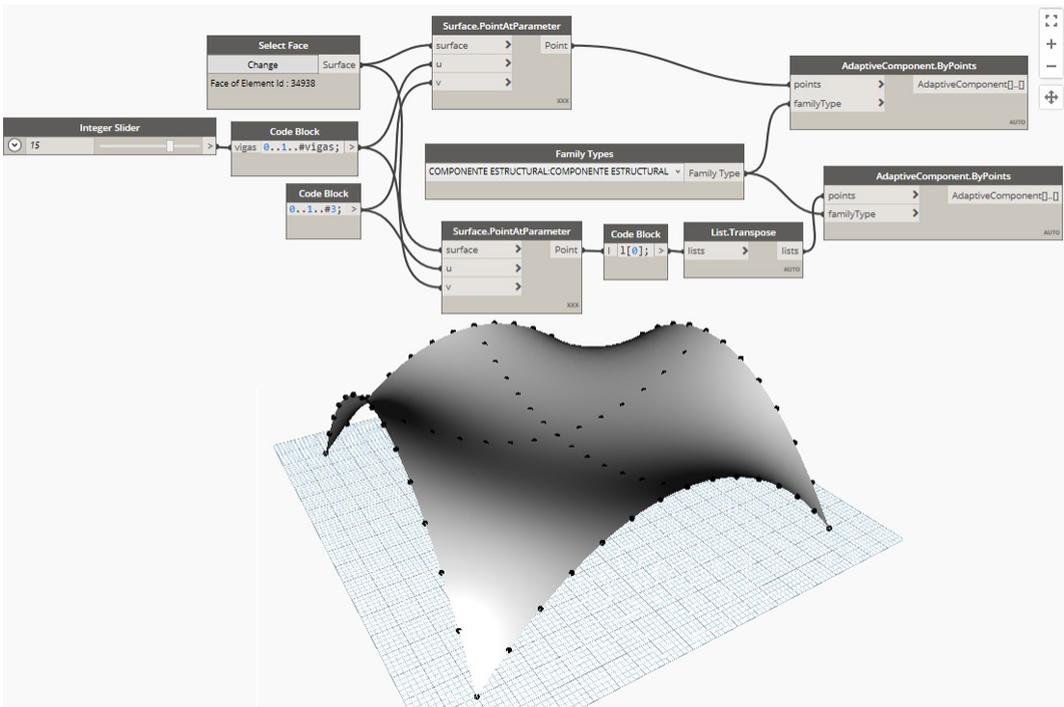
Fig. 5 The HBIM model.

and re-processing of information. Therefore, we have a concept of Virtual not as schematic opposition between the “Real” and the “Other”, but “Virtual” as actualization and resolution of a problematic field. And in this game, a non-secondary cultural role is played by users who interact each other (Brusaporci, Maiezza, Tata, 2018c). In the digital representation field, the effective and final restitution is the interpretative critical meta-model, and not the individual and ephemeral static rendering.



**Fig. 6** San Basilio Square in L'Aquila (IT). Visualizing the historical reconstructions in Augmented Reality.

The reflection on the concept of “Meta-Model” combines with the potential offered by Augmented Reality applications offered by ICT: through visual devices, information is superimposed in transparency on reality, that is on the direct vision of the observer, in the moment of the experience itself. There is no deception: the observer has clear that the digital image is different from the material world, it is information that accompanies the “Physicality”. An addition, an informative enrichment, but in the absolute ontological respect of the Reality itself. There is no contact, the Reality is not altered in its materiality, but in its mediated through the image. The concept of avatar changes: the user does not alienate himself in another-self within a synthetic environment, his feelings are not artificially produced as in VR. The user interacts with the real world: it is not correct to say that the user becomes the concept of avatar of himself but rather the avatar no longer makes sense to be. On the contrary, in a certain sense, there are the avatars of the physical objects, that is they are partially virtualized through AR visualizations, but in the sense of Lévy (1995): they acquire a “poten-



**Fig. 7** Visual Design. Modeling a vault.

tial” in each specific visualization. There is a marriage between digital reality and tangible reality that occurs in the field of the image (Brusaporci, 2018; Brusaporci, Graziosi, Franchi, Maiezza, 2019; Brusaporci, Centofanti, Maiezza, 2017; Ch’ng, 2019).

Maybe this situation may look as dangerous as the one preconized by Baudrillard, but in the post-digital age, for the digital natives (Prensky, 2001), the ontological game is with cards on the table: there is no doubt about what is digital and what is tangible. Both of them are Real. Certainly there could be critical issues, even related to the “wow” effect – that is the fascination of the spectacular – especially related to the continuous technological innovations. Even if, as the generations go by, people are by nature ever more used to surfing among the different visual manifestations of the Digitality (Jenkins, 2007). We recall the concept of “Uncanny Valley”

(Mori, 1970), concerning how the feeling of familiarity aroused by anthropomorphic robots increases as their resemblance to the human figure increases, but at a certain point the human likeness produces a sharp drop in emotional reactions with unpleasant sensations and repulsion; this accentuates if the humanoid has the ability to move. Mutatis mutandis, reflecting on digital visualizations, in today's "pervasive digital visualizations", the disturbing element would rise by the excess of photorealism in VR that the user knows is not from reality. Moreover, it could be also induced by the perception of "too human" interactions given by A.I., that is – similarly to Mori's moving humanoids too similar to real people not only in the aspect – the discomfort could be provoked by an A.I. too insolent in its consciousness of "humanity" and "inhumanity".

In any case, the perception of Reality (once again we remember the "New Realism") is pivotal. The very problem is the relationship between the images of tangibility and the images of the digital model – images of the model both as a final product and as meta-model –.

In conclusion, Tangibility and Digitality are both visual expression of different realms of reality. The digital model, in its manifestations, works for a re-mediation of tangibility: it is a restitution of the tangible content, where the interpretative model elaborates information in a visual way, but images have to be compared with the physical reference from which they rise and on which they are rooted. In this marriage, like a wedding dancing, the tangibility come back to re-mediate itself through digital images.

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# **BUILDING TERRITORIES AND LANDSCAPES**

## THE ESSENTIAL KNOWLEDGE OF A FORGOTTEN CULTURAL HERITAGE

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## ESSAY 05/01

TERRITORY  
LANDSCAPE  
ANCIENT CARTOGRAPHY  
CULTURAL HERITAGE

A deep knowledge of a building or a city centre is needed before undertaking any planning or restoring activities.

This knowledge becomes particularly essential when historical buildings or towns are concerned, but it seems to be less important when the subjects are territories and landscapes.

Such a resistance to change the scale, together with the lack of a true culture of landscape, are the result of wrong or restrictive scopes that ignore the heritage qualities produced by centuries of human traces. We focus on the construction of the territories and the landscapes by means of both innovative and traditional methodologies.

## INTRODUCTION

**Fig. 1** Spanish Anonymous 17th century, *Carta topográfica de un tramo del río Pisuerga en las cercanías del lugar de Mave (Palencia) dividido en dos ramales mediante un presón.* Real Chancillería de Valladolid, Ministerio de Cultura de España. Local plans and views used in civil disputes were finished off by means of precise written descriptions that helped to avoid inaccurate drawings. Nevertheless, boundaries and property lines were represented in such a way that nobody could be led into error.

The knowledge of the way both territory and landscape were built throughout the centuries is a fascinating task where historical, ethnographical, architectural, artistic, literary, natural, or archaeological phenomena meet within a particular area (UNESCO, 1972). This essential knowledge must be achieved prior to undertake any urban or regional planning, or even to plan any touristic or economic development.

Definitions of territory and landscape are outlined following criteria of objectivity. From the traditional geographic point of view, the territory is the set of natural elements which are studied under the scope of the Physical Geography, in addition to the set of human constructions which are studied by the Human Geography (Terán et al., 1987).





**Fig. 2** Francisco Nande 1749, *Mapa del Puerto de Guadarrama y sus contornos en que se demuestra la nueva carretera.* Archivo Cartográfico y de Estudios Geográficos del Centro Geográfico del Ejército, Ministerio de Defensa, Madrid, Spain. Some of the roads that were built during the Kingdom of the Spanish Bourbons were accurately drawn and defined in every single detail, as it is shown in the maps. Most of them are still preserved, and along the field work they are measured and drawn, while all possible changes from the original projects are checked.

Although some of these phenomena have no physical materialization –such as a district boundary or a precinct–, all of them are measurable, and can be georeferenced.

On the other hand, the idea of landscape results from the perception that population has about a territory, being thus a subjective approach (European Council, 2000).

As a consequence, a transdisciplinary convergence is needed in order to have a deep knowledge of the construction of a particular region. From this perspective both historic (Figure 1) and current objective data, and subjective perceptions will be gathered (Chías, 2012).

Our main target is to know, describe, analyse, and diffuse such an interesting unknown heritage.

## METHODOLOGY

Due to the circumstances, scales and features of these kind of researches, we designed a specific methodology to be applied worldwide, that gathers both the transdisciplinary focus and the use of modern information and communication technologies (ICT). To that effect we also foster the use of open source software. Our team is composed by architects, civil engineers, art historians, surveyors, computer experts,

sociologists, etc. This way we can cover the broad spectrum of tasks to be fulfilled throughout each research project.

Once the area to be studied is adequately delimited, the structure of the project must be defined in its different coordinated stages.

The first phase develops an exhaustive research of written, drawn, photographic, and cartographic sources stored in the main Spanish archives and libraries.

They bring to light essential historic and current data about the main components of the territory, as for instance old customs (Chías & Abad, 2014), traces of ruined buildings arising from toponymy (Chías & Abad, 2016a). Sources also bring information about the main historical routes with their elements, old towns and their development, traditional land uses and industries, landownership, etc.

At this first stage the old stone quarries are also located, together with the main constructions, fences, and bridges. Old Roman roads, their evolution and different layouts, that were traced according to political decisions or economic reasons, are also detected (Figure 2).

**Fig. 3** Lucas Condant 1724, *Reconocimiento y origen del Río de Manzanares, del Río Samunil y sus agregados*. Archivo Histórico Nacional, Madrid, Spain. The map and its legend name and locate some towns and places upstream from Madrid: the castle of Manzanares, the Royal Estates of El Pardo and Casa de Campo, fountains, orchards and crops, bridges, mills with their owner's names, dams and watercourses, old and new channels. All of them were built along the river Manzanares and its main tributaries.





**Fig. 4** Tomás López 1773, *Mapa de la Provincia de Madrid*. In Atlas Wellington, ca. 1810. Biblioteca Nacional de España, Madrid, Spain. It is a facsimile atlas owned by the Duke of Wellington (as signed on the back cover) during the Peninsular War. The lack of accuracy of the topographical description is noticeable, while the location of the geographic elements results from their topological relationships.

**Fig. 5** Tomás López ca. 1763-1802, *Diccionario geográfico-histórico de España*. Mss. Biblioteca Nacional de España, Madrid, Spain. Tomás López bestowed a grant in Paris provided by the Enlightened Spanish statesman Marquis of Ensenada, with the aim of improving the cartographic techniques. As 'Royal Geographer', López devoted himself to draw and print lots of maps that he produced by compilation. His atelier was in Madrid, at the Calle ancha "facing to Monastery of St. Bernard". He used all kind of geographic sources then honestly mentioned on each map. He tried to compensate the lack of information by sending a questionnaire—his famous Interrogatorio—to the priests and mayors of every Spanish town, no matter its importance, aiming to produce his finally unfinished *Diccionario*.



These variations can also be followed through the detailed descriptions of travellers and writers as Antonio Ponz (1785): "The new and solid made road to Castile goes from Madrid far beyond El Espinar. At the highest point of the Guadarrama Pass you can find a column with a lion on top, where an inscription by D. Juan de Iriarte is engraved: *Ferdinandus VI Pater Patriae Viam utriusque Castellae superatis montibus fecit. anno salutis MDCCXLIX Regni sui IV*".

The research also collects datasets about changes in vegetation and woods, in rivers, and in other geomorphological features, as those related with mining (Chías & Abad, 2004) (Figure 3). The late encoding of topography by using contour lines, and its usual worth painting representation (see Figure 1) were frequently misleading when understanding the reality of territory (Chías & Abad, 2016b).

This fact was particularly serious in war campaigns, as it was stated by the French officer Bory de Saint-Vincent (1823) during the Peninsular War: "Crests, pikes, anastomosis, spurs, and all



**Fig. 6** Junta General de Estadística 1860-1870, *Topografía Catastral de España, Catastro de rústica, Hoja Kilométrica 31L* (Aranjuez). Instituto Geográfico Nacional, Madrid, Spain. This set of maps 1:2,000 was produced according to the highest standards of accuracy. The project included the related cadastral information of each plot. Although unfinished, the project is still an outstanding source of geographic, rural and urban information of the Spanish territories in the mid-nineteenth century. The set of their first drafts is still preserved. It served as the basis of the National Topographic Map (*Mapa Topográfico Nacional*, MTN) of Spain 1:50,000, that was produced two decades later.

thinkable black chiselled features, were multiplied to separate slopes falling towards the Mediterranean Sea and the Ocean, showing a rugged Alpine appearance. However, wide plains [...] just extend where these supposed mountains should be. Confused about these directions, the military man estimates about hindrances or defence places he will never find; the naturalist dreams about a steep propitious to his researches, that will turn into an arid horizontal area”.

Maps are essential sources of information. However, ancient maps were scarcely used in traditional researches about the territory and the landscape, due to a lack of a basic cartographic knowledge that hindered their adequate interpretation. Early map symbolization before the 19th century were hard to read and understand, being as beautiful as ambiguous (Chías, 1994) (Figures 4, 5). Each ancient map resulted from political interests. According to these targets, maps showed a deliberately selected range of geographical features.

**Fig. 7** José de Hermosilla y Sandoval 1757, *Vista del Monasterio de El Escorial*. Biblioteca Nacional de España, Madrid. The set of drawings produced by Hermosilla, Arnal, and Villanueva illustrated the works about the Spanish monuments fostered by King Fernando VI. He was conscious of the lack of Spanish heritage knowledge and diffusion, but also of the importance of ancient architecture to train the new architects at the Real Academia de Bellas Artes, he had just created in Madrid. Hermosilla met the team of engineers Balthazar Bécaud and Bernardo Cillera, which were surveying the Monastery. Although these drawings should have been printed, they were finally used as a decoration in the royal rooms at Aranjuez Palace (Chías, 2015). This drawing brings a neoclassical perspective of the monument.

Along the 19th century the international monosemous conventional signs were gradually being accepted worldwide, what made their interpretation easier.

On the other hand, the evolution of the surveying and printing techniques increased the cartographic accuracy, although the depicted elements always resulted from various selection processes (Figure 6). Finally, the choice of the scale brings a wide range of possibilities in the cartographic representation.

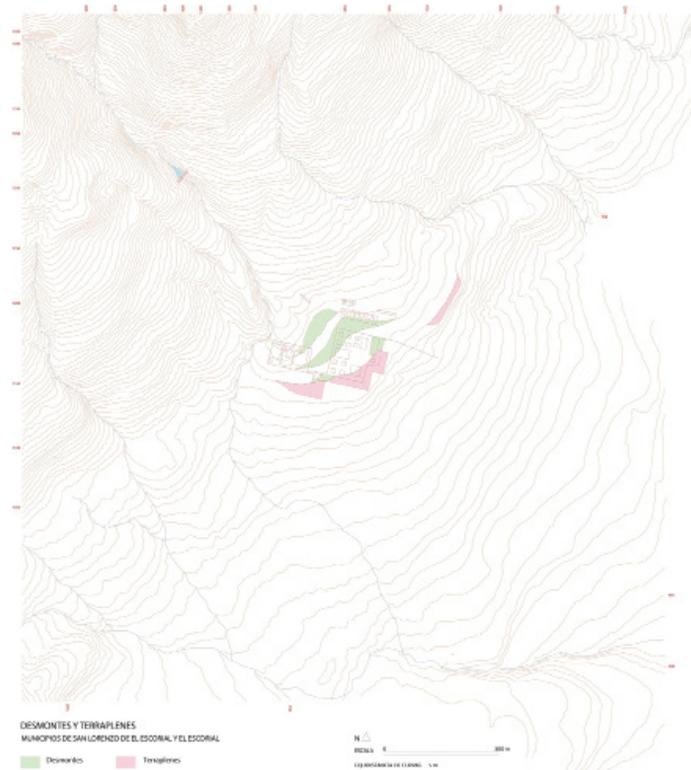
In our research project, each geographic element or phenomenon is stored in a relational multiformat database. It includes structured sets of data about the type and epoch, their precise location, the way to access, together with other information related to history, style, administration, etc. A detailed description together with the main sources are also provided (Chías et al., 2007).

The field work is developed along the second phase, when we check if the element is preserved or destroyed. Attention is also paid to the overall condition.

The element is then drawn and surveyed, photographed and georeferenced. According to the importance of the ele-



**Fig. 8** P. Chías and T. Abad 2016c, Map showing the earthworks made while levelling the ground of the Monastery of San Lorenzo of El Escorial. The digital cartographic basis, scale 1:25,000, allows to measure the cubic meters removed during the construction, as well as the topographic profiles before and after the construction of the platforms of the Monastery and the surrounding *Lonja*, and *Terreros*.



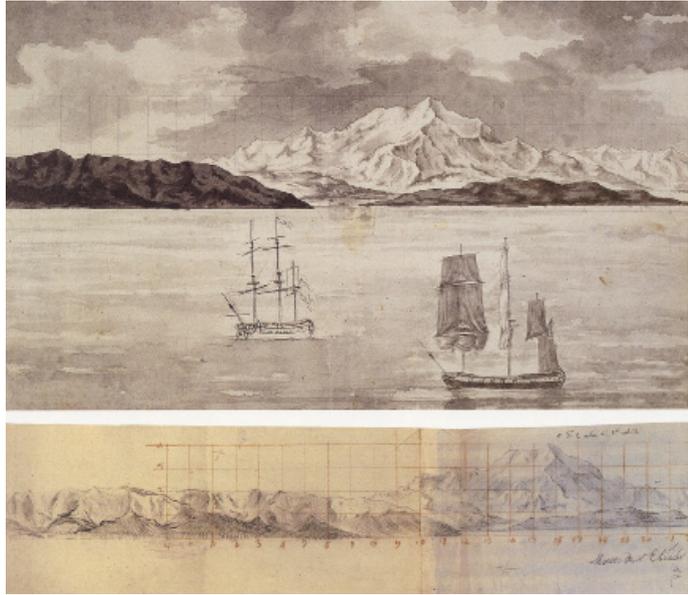
ment, it is depicted in full detail by means of photogrammetry or laser scanner techniques, or simply sketched.

Digital drawings, together with the set of actual and historic images (Figure 7), are also collected and stored in the databases. The digital cartographic basis is produced as a parallel process at a scale of 1:25,000. It is composed by layers representing each type of geographic element. The map includes both hypsometric and planimetric information. It is distributed in sheets which correspond to those of the National Topographic Maps of Spain (MTN50).

Geographical features are located on the map according to the georeferenced data that were collected during the fieldwork (Figure 8).

Databases and cartography are then integrated into a geographic information system (GIS). It allows users to create interactive queries –user-created searches–, analyse spa-

**Fig. 9** Felipe Bauzá, *Las corbetas Descubierta y Atrevida ante el monte San Elías. Dibujo y Apunte preparatorio.* Museo Naval, Madrid, Ministerio de Defensa de España. Surveying techniques of coastal profiles were mastered by Spanish cartographers and naval officers since Antonio de Ulloa and Jorge Juan took part in La Condamine's expedition. Among them the works and drawings of the naval officer Felipe Bauzá must be highlighted. He was trained by the famous Tofiño when he was drawing his essential *Atlas Marítimo de España*. Bauzá also took part in the Malaspina Expedition, and in the later Espinosa Expedition, drawing highly detailed interesting views of coasts and landscapes.



tial information, and edit data in thematic maps. This late output is particularly interesting because it can produce sets of historical maps that show the different phases in the construction of the territory.

Another outstanding result is the set of thematic maps about civil works such as roads, navigation channels, or water supply systems. The development of towns, or industries such as mills, saltworks, etc., can also be studied.

## CONCLUSIONS

Through the last decades we designed an essential methodology, that is pioneer and useful in researches involving the territory and the landscape. It can be applied to many different geographical areas, both in Spain and abroad.

Among the main conclusions of our work one must be highlighted. It is the influence that geographic features and landscape qualities have in the location and development of human activities. Towns, roads, or pre-industrial workings are just a sample.

Comparative analysis gives also interesting information about the successive historical periods and their traces on the territory.

The validity and interest of the methodology and its results was evidenced by the many financed national and regional research projects we obtained, that have caused an outstanding set of scientific publications.

On the other hand, diffusion is guaranteed by means of web sites with various access levels, permitting to get information about the territory to different groups of users.

Finally, this essential knowledge can be directly applied in heritage catalogs and preservation norms. A knowledge that makes possible to preserve the remains and traces of a past that otherwise would have been neglected.



**Fig. 10** Félix Borrell 1901, *Paisaje de El Escorial*. Museo Nacional del Prado, Madrid (now at the Spanish Congreso de los Diputados), Spain. Landscape pictures and views are essential complements to other documents. They bring information about Geomorphology, vegetation, and buildings. When compared with actual views, they become useful in visual impact assessment.

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# DIDACTIC ICONOLOGY

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## ESSAY 08/01

ICONOLOGY  
ICONOGRAPHY  
TEACHING  
LEARNING  
IMAGE

*Didactic iconology* is the study of images finalised to educating or, strictly speaking, to education. It is connected to the pedagogy of the media, to children's literature, to psychology, to the history of illustration. On the historical level four points of reference define the profile of this field of study. In particular, the communicative force of the images finds outside of school the best terrain in which to

express its didactic potential, through a multi-media network that accompanies the subject starting from childhood. In fact, the didactic iconography aims to study, on the one side, that world of images that activate a direct relationship with children in their free time and in play; on the other the visual repertoires whose didactic dimension is also characterised by the mediations with which they are managed.

By the term “didactic iconology” we mean the study of images finalised to educating or, strictly speaking, to education. The term “iconology” is used in this context, coherently with its meaning, applying it to the study and the interpretation of the figurative works dedicated to the educational sphere, and not scholastic. That character consists in wanting to convey cultural information and contents, or in wanting to facilitate the learning of given knowledge, making interesting a historical argument or a scientific concept or, more simply, showing or recognising something so as to name it or describe it.

Didactic iconology is connected, on the methodological level, apart from to the contents, to the pedagogy of the media, to children’s literature, to psychology, to the history of illustration. On the historical level some points of reference define the profile of this field of study: here are four of them, in brief: The first one sinks its roots in the middle ages, and refers to the progressive legitimation and affirmation of the use of images by the Church, after the Council of Nicaea in 787, as an instrument of catechesis above all addressed to the illiterate population. A testimony to this are the *Bibliae pauperum*, the great spreading of iconography with the paintings and the bas-reliefs in the cathedrals, and then with the painting after the turn-around imposed by Giotto. The story in images takes shape which, albeit essentially oriented to themes of Sacred History, is characterised as a truly authentic didactic device for popular education on the contents of the faith.

The second aspect is that which, on the grounds of the printing techniques at first with engravings on wood and later on metal plates all the way to modern lithography, puts into circulation iconographic repertoires of varying aesthetic and cultural models. They find in scientific and didactic illustration and, in general, in the dissemination of knowledge, a great field of application and an ever vaster and interested “public.”

Within this public, a significant space is occupied by childhood, and this is the third aspect on which to build the modern didactic iconography. The “discovery of childhood,”

in the terms in which the historian Philippe Ariès defined its cultural traits, becomes the presupposition that leads to the development of a new educational conception and of a “market” of products dedicated to children: above all toys and images, spelling books, illustrated books, picture cards, etc.

The fourth point of historical reference regards schools; starting from the 17th century, with Comenius who published the *Didactica Magna* (1657), the treatise from which the modern school takes shape and, the following year, the *Orbis sensualium pictus*, the first illustrated textbook for children, we can speak of didactics as the science of education, a method that guides the process of teaching/learning, where the word-image synergy becomes crucial. With the birth of the modern concept of “public school,” where the right of everyone to education is upheld, didactics defines its efficacy also on the grounds of the use of the appropriate aids. Images would thus become some formidable didactic catalysers, in particular for those disciplinary fields predisposed to be accompanied by visual repertoires. From the invention of printing onwards, every new technology of communication would be pedagogically put to the test, that is to express its educational potential.

The modern school, in the course of its modern history, on the one side discovers the potential of images in support of teaching, while on the other it fears their intrusiveness and the pervasiveness: it realises that in many cases images bear with them ideas, that is they “communicate” more than they should in the strictly didactic sense. The pillar of didactic communication based on the tradition of the “Scholastics,” represented by the lesson-lecture and the centrality of the figure of the teacher, and his “art of the explanation,” struggles to come to terms with the images, to concede to the visual dimension a communicative space that goes beyond the contained and controlled one which is reserved to them in the textbooks and in the so-called ‘aids’ in which the images are often didactically anaesthetised.

From the didactic standpoint, the images pay for a sort of “original sin” that has a dual connotation: the first one refers

to the pleasure principle, that is to the fact that looking at the figures (reading a comic, watching a film or being immersed in a videogame) is first of all constituted as a sensitive experience that triggers the visual pleasure in the subject, springboard for fantasy and imagination, that is the capacity (the need) to see beyond the image that is being looked at. Traditional didactics does not have familiarity with the pleasure principle, as it essentially operates in the realm of duty or in any case in the teaching/learning devices that, without necessarily being coercive, are external to the subject's needs.

The second connotation is due to the fact that the images are placed directly in relation to the subject, without the need for mediations. This (apparent) ease of access to its immediate "reading" makes the image *docentibus soluta* and creates the minimal conditions for its autonomous understanding by the subject. The images at first sight seems to impose nothing upon its reader, neither grammar nor syntax, leaving him or her free to find (seek) his or her own meanings.

The communicative force of the images finds outside of school the best terrain in which to express its didactic potential in the register of cultural dissemination, through a multimedia network that accompanies the subject starting from childhood. The didactic iconography aims to study, on the one side, that world of images that activate a direct relationship with children in their free time and in play, on the grounds of the prerogative to offer a pleasant and attractive experience without requiring any bond; on the other the visual repertoires whose didactic dimension is also characterised by the mediations with which they are managed. It is an immense output, which already has a significant history behind it and a future laden with expectations (pedagogical and technological) even if, being a matter of "didactic" images they have still undergone a devaluation, like everything that concerns culture for childhood (cinema, literature, illustrations...), on the grounds of an "aesthetic bias" incapable of adapting certain critical categories to new objects of study. The words of Roberto Rossellini come to mind, who in 1962,

during an interview with Cahiers du Cinéma said: “And it’s important to have the courage to be didactic. But when one is so in cinema, one is accused of being an imbecile. And yet, the need for didacticism is an absolute need.”

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# GRAPHIC, VISUAL AND IMAGE SCIENCES

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## ESSAY 06/01

GRAPHIC SCIENCE  
VISUAL SCIENCE  
IMAGE SCIENCE

Visual sciences, image sciences and graphic sciences are just some of the different possible definitions that can be found in literature to define the field of investigation on the production, perception, visualization, reading and interpretation, of images.

Although they represent different approaches and disciplinary traditions, they are often used as synonyms. In this paper is discussed why terms so different in meaning are so interconnected and why

it is impossible to investigate one of them without consider the others. *IMG journal, Image, Imagination and Imagery* has a great potential that is that of becoming a space of maturation, development and deepening for what can be called image sciences, or visual sciences, or graphic sciences. These definitions, which as will be explained below, are often used as synonyms despite the fact that the words they are composed of have profoundly different meanings.

The foundation of a new scientific journal in a time when scientific journals are multiplying vertiginously, questions us about its real meaning, and stimulates us to search for the deepest cultural reasons, going beyond the purely commercial, academic, evaluative and ranking logic both national and international.

A scientific journal must represent a space for discussion among scholars who share a field of investigation, or an approach, or a look.

A scientific journal needs a community of researchers interested in expressing their positions, in presenting their work on that editorial space, because they consider that particular public to be the most interested, competent and attentive.

A new scientific journal requires that there be areas of knowledge that have not yet been fully explored, whose boundaries appear blurred, whose contents need to be studied in depth, whose scholars need a reference that can orient their research.

For this reason, IMG journal, Image, Imagination and Imagery has a great potential that is that of becoming a space of maturation, development and deepening for what can be called image sciences, or visual sciences, or graphic sciences. These definitions, which as will be explained below, are often used as synonyms despite the fact that the words they are composed of have profoundly different meanings.

This field of investigation appears difficult to define, but two lines of research belonging to different disciplines, that of pedagogical matrix (Balchin, Coleman, 1966; Bleed, 2005) and that of cognitive psychology (Gardner, 1983) and psychology of perception (Massironi, 2002), can contribute significantly to their identification.

Starting from the studies from cognitive psychology and in particular from those of Gardner, it is possible to identify within the continuum of intelligences the graphic and visual intelligences that characterize the skills necessary for the production and reading of images and therefore to isolate the cognitive abilities that are the object of the graphic and visual sciences.

In the literature, such skills have been instead assimilated to other broader intellectual human abilities such as the spatial intelligence (Gardner, 1983). Actually, they also are considered an amalgam of skills, to the point that in this area of research the word visual often comes to be used as a synonym of spatial, because spatial human intelligence is closely related to the observation of the environment. Therefore, in this continuum of human intelligences, we can identify, confine and define the graphic intelligence (Cicalò, 2016) as well as the visual intelligence (Ferguson, 1978), which is certainly in close relation with other forms of intelligence and particularly with the spatial one. The spatial intelligence has been defined by Howard Gardner (1983) as the composition of different skills connected among them. They work as a family and are able to support each other. The ability to recognize images of the same object, the ability to visually transform an object in another or to recognize this transformation, as well as the skill to make a graphic representation of the spatial information belong to this family. Thus, the graphic skills would be part of the spatial intelligence and it would be also the basis of the ability to represent in two or three dimensions the real world by using symbolic codes, as in the case of geographic and topographic representations, diagrams, and geometric figures. The graphic intelligence, or the skill to use the graphic abilities, and more in general the coordination of eyes, mind and hands –perception, cognition and representation– in order to solve problems or to create products.

Of great utility are the studies of Massironi (2002) who analyzed the taxonomy of graphic products. Massironi selects the most relevant uses of drawing in human communication in different eras, for different objectives, without claiming to create an exhaustive taxonomy. Its diagram is drawn as a river ramification in which the different branches can intersect, disappear or originate other branches. According to this approach the model is continuously subject to transformation, deformation, expansion, reduction. The flow of knowledge is sometimes rapid and vigorous, others slow and stagnant.

The springs become extinct and then reappear. The flow is continuously directed towards the sea but the two main tributaries, that of representational and non-representational images, remain constantly active.

Another important contribution to the definition of the graphic and visual sciences comes from the pedagogical field in which many scholars are involved in defining what should be the necessary skills within the different educational curricula. Learning the languages based on signs, both verbal and non-verbal, concerns not only the decoding processes of the signs perceived but also the complex process of coding of the same signs. So, also the learning of images-based languages requires the development of the coding and decoding the visual information. Therefore, it makes sense to speak of graphic communications to refer to the coding of the message that will be then decoded through the perceptive processes usually associated with the expression of visual communication.

Generally by visual education, or image education, we mean both the understanding and the production of images (Bleed, 2005) but also in this case the definitions are not always shared (Brumberger, 2011) and the productive component is always relegated to marginal roles if not completely absent, as demonstrated by the diagram that Avgerinou and Ericson (1997) have built on the basis of the analysis of literature on the subject. The diagram represents the sphere of visual literacy as a family of competences concerning: visual perception, visual communication, visual languages, visual thought, visual learning. On the other hand, there are different competences in literature that are included in the graphic sphere (Delahunty, Seery, Lynch, 2011), such as skills in the fields of manual drawing, geometry, modelling, spatial thinking, visualization, problem solving and design. Although there are also in this list of overlapping with the sphere of visual and spatial intelligence, there emerges a strong connection but also a different connotation between graphicacy (Balchin, Coleman, 1966)—understood as the ability to communicate through visual messages such as images,

maps, diagrams, graphics, symbols and drawings—, and visual literacy, which focused on visual perception, visual communication, visual languages, visual thought, visual learning. Pedagogy and Psychology, together with Representation and Communication, have been the fields of investigation on which IMG has focused its attention since its first conference in 2017. Pedagogy and Psychology are precisely the areas that can be most useful in defining the areas of investigation of graphic representation and visual communication; the areas of investigation of what can be defined as graphic and visual sciences, in which the adjectives graphic and visual refer to the double relationship that can be established between the individual and the image: the individual as a producer of images and as a reader of images. Knowledge of the processes of perception makes it possible to define the strategies of graphic representation. The awareness of the perceptual mechanisms of decoding the image is the key to the design of encoding visual messages (Massironi, 1989). Knowing the cognitive paths of decoding, it is possible to define those of codification of graphic signs aimed at the transmission of messages through the visual channel. The study of graphic representation cannot therefore ignore that of visual perception. Therefore, the graphic dimension and the visual dimension are the two complementary dimensions of the images.

Graphic and visual actually identify two different faces of the same medal (Massironi, 1989) where the term graphic is linked to the coding of signs that is the basis of the production of images while visual is instead linked to the process of decoding the act of perception. Graphic representation and visual perception are two closely linked processes because in order to code the signs correctly it is necessary to know the mechanisms by which they will be decoded. However, in the literature also the terms representation and visualization are often used as synonyms if not as equivalents. Visualization is defined as a rigorous and systematic graphic representation of data, information and knowledge aimed at communicating and understanding what could not be communicated in

an alternative way (Lengler & Eppler, 2007; Yoon, 2017).

The sciences that aspire to investigate images have to be developed according to this double identity. For this reason, very often in international literature expressions such as image sciences, visual sciences and graphic sciences are used in an alternative way.

Visual sciences (Bertoline, 1998), image sciences (Mitchell, 2018) and graphic sciences (Suzuki, 2002) are just some of the different possible definitions that can be found in literature which, although representing different approaches and disciplinary traditions, are often used as synonyms.

In addition to being linked to different disciplinary traditions, the use of these expressions is also linked to linguistic considerations. The search for an expression that is universally recognized and identifying a particular field of study can be problematic due to the difficulties of translation. Translators select the most suitable words to express concepts, always making an approximation and a compromise (Eco, 2016).

In the Japanese disciplinary tradition, for example, the expression graphic sciences is used as a translation of the expression in which the ideogram is translated as graphic/graphical but could also have the meaning of drawing; image, diagram, figure, illustration. This conception of graphic sciences includes three areas: the theoretical one of geometry, the technical one related to representation and the cognitive and psychological one (Suzuki, 2002); an articulation very close to that used by Bertoline to connote the visual sciences, based on geometry, representation and spatial thought. It can therefore be said that often in literature the expressions graphic sciences and visual sciences are used to connote the same field of study. To further underline how ambiguous the distinction between these expressions can be, it is sufficient to think of how Gary Bertoline (1998) began his discussion in defining the visual sciences using the expression graphic or visual sciences, then preferring the expression visual sciences to that of the graphic sciences because, in his opinion,

the latter would be limiting because it is linked only to texts and images, while the adjective visual would be able to understand everything that the eye can perceive. This broadening of perspective that characterizes the use of the adjective visual is then highlighted in what in international literature are defined as visual studies that identify a field of study even wider that reaches to embrace art, aesthetics, anthropology, sociology, history, communication, design, photography and film (Barnhurst, 2004), ie all those fields of knowledge based more on the production of the image on its perception and interpretation.

Therefore, in the light of this, if a new scientific journal requires unexplored areas of knowledge, whose boundaries appear blurred, whose contents need to be explored in depth, whose scholars need a reference to address their own research, then IMG journal, Image, Imagination and Imagery, with its interdisciplinary and international vision, can play a fundamental role by enhancing the experimentation already opened by the IMG conferences towards the exploration of the fields of investigation that define the graphic and visual sciences, or science of images.

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# VISUAL CULTURE/ REPRESENTATION TRAVEL NOTES

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## ESSAY 07/01

IMAGINARY QUESTION  
CULTURE OF REPRESENTATION  
GRAPHIC INVESTIGATION  
CROSS-MEDIA REPRESENTATION  
VISUAL TEXTS

The critical horizon of the paper is that which considers the 'imaginary question' as an essential premise for any reasoning on the culture of representation as it is declined in the cultural production of contemporaneity. In this context of reflection, the 'question of images' requires particular attention about the role of the viewer and the practices of fruition and consumption of visual texts; processes that include questions relating to the mechanisms of the gaze, to the different forms of visual effectiveness of a text, to the 'performative' value of im-

ages and that is, to the ability they have to induce us to do things, to suffer from them, to modify cognitive and tactical itineraries of behaviour. In the final analysis, the contribution intends first of all to ask questions about the meaning that today the delicate process that governs the transition from vision to representation and from this to the 'attribution of meaning' has, placing once again the topic of the reference link. That is to say the link between relevance signs and pragmatic factuality, as central for the culture of representation.

*There's always an image at the beginning.  
If there is no image I do not see the story.  
G. García Màrquez*

In my personal wanderings through the issues of representation, it always seems to me that I have to return to a core of central reflection in which, despite the diversification of approaches and themes, each thought seems to regain its meaning and at the same time the impetus for any subsequent speculation. It is like always writing the same book!

The same ideas chase each other and yet at every step it seems essential to question them, reconsider them in the light of new acquisitions, new contexts and new interpretative hypotheses in a wider space of meaning.

A question before any other: that of the visual dimension of representation, which is the real plot of my personal story. The need, that is, to always address the themes of representation starting from the assumption that it is essential to look in a problematic way at the “image question” as it is declined in the cultural production of our time. This means asking oneself questions about the meaning of the delicate process that today governs the passage from vision to representation and from this to the “attribution of meaning”. Which, then, in the final analysis, means to question oneself, using the words of Anceschi, on the central topic of the “referential link or rather the link between relevance signs and pragmatic factuality”.

In this critical horizon, the “question of images” requires particular attention about the role of the viewer and the practices of fruition and consumption of visual texts; processes that include questions about the mechanisms of the gaze, the different forms of visual effectiveness of a text, the “performative” value of images and that is, their ability to induce us to do things, to suffer from them, to modify cognitive and tactical ways of behaviour.

A way of understanding the imaginary question in which the dialectical relationship established between the observer and the modes of representation is, therefore, fundamen-

tal, terms that have undergone significant transformations of meaning following the widespread diffusion of virtual visual spaces that have progressively repositioned the vision in a separate plane from the human observer. “Most of the functions of the human eye have been progressively replaced by visual practices in which images no longer seem to have any reference to the position of an observer in a ‘real’ world according to the laws of optics”. Understanding this change requires a historical look at the evolution of the perceptual visual processes and outcomes in terms of image production. Not surprisingly, the reflection on the imaginary question repeatedly stumbles upon the folds of the copious cultural legacy of that period of thought that first investigated the field of figuration, conceiving visual investigation as an operational category, and ‘drawing’, in the active sense of ‘project’, as an inventive and morphogenetic process. This is the season that, starting from the exercises of *Grundkurs*, the basic course of Bauhaus, passing through the extensive experience of Basic Design, comes to us today, including the kinetic, interactive, multimodal dimension that preludes that universe of ‘digital forms’ in which the principles of growth, evolution, reproduction, transformation, permutation, assembly, are combined with the development of information technologies, inaugurating new languages and new conceptual paradigms.

This critical horizon is crossed by the question of the “visual rhetoric” that presides over the definition of current figurative languages and inverts that art of showing, which today far surpasses the art of saying, clearly shifting the interest from the object of representation (understood in the broadest sense of the term) to the dynamics of its visual presentation, as if to emphasize that, in the end, every representation is “an act, a gesture that makes a communiqué of the object”. But in this process, which therefore sees the terms of representation and communication dialoguing with interesting superimpositions of meaning, the advent of the second and third computer age -to which corresponds an unstoppable

process of diffusion of the new technologies and a substantial democratization of the processes through the Net- has produced a proliferation of forms of “cross-media” representations in which the new digital languages are interwoven with the new practices of participation, of documentation and with which today collective enterprises of representation of reality are staged on multiple and free platforms in which the contents of images crowd, add up, overlap, share, merge and force us to look for the first time at representation as a collective “open work”.

A horizon of great innovation and interest for representation, whether we ask ourselves about the possibility of defining and describing the birth of “new representative strategies”, which seem to be able to modify the very meaning of representation, questioning the very dimension of authorship and insinuating into it new and intriguing horizons of reflection, or whether we reflect on the birth of new users and users of images, able to interact directly, though not technically, with the process of production and exchange of new forms of representation. So the ‘image question’ will probably continue to represent the beginning and the end of any future investigation of mine.

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**VISUAL  
COMMUNICATION  
AND DRAWING**  
A LABORATORY  
EXPERIENCE  
FOR THE SCIENCES  
OF PRIMARY  
EDUCATION DEGREE  
COURSE

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## ESSAY 09/01

VISUAL COMMUNICATION  
GEOMETRIES  
DRAWING  
GRAPHIC LANGUAGES  
DRAWING FOR CHILDREN

This paper describes the experience of a three-day workshop at the end of the Visual Communication and Design course, in the first year of the Sciences of Primary Education degree course. The days of full immersion turned into a lively and creative “happening” during which communication and representation strategies for children were

put into practice. The activities of painting, comics, photography, art and geometry were combined and integrated in order to experiment with reading images and to learn how to compose with them. At the end of the workshop, an exhibition of the final works was held, open to pre-schools and primary schools.

## INTRODUCTION

This paper describes the experience of a three-day workshop at the end of the Visual Communication and Design course, in the first year of the Sciences of Primary Education degree course. The days of full immersion turned into a lively and creative “happening” during which communication and representation strategies for children were put into practice. The activities of painting, comics, photography, art and geometry were combined and integrated in order to experiment with reading images and to learn how to compose with them. At the end of the workshop, an exhibition of the final works was held, open to pre-schools and primary schools.

## BACKGROUND

On this basis, the first Visual Communication and Design Workshop for the new Master’s Degree Course in Sciences of Primary Education was held on December 4, 5 and 6, 2018. The workshop was held immediately after the closure of the course and gave the students the opportunity to put communication and representation strategies for children into practice. The activities of painting, comics, photography, art and geometry were combined and integrated in order to experiment with reading images and to learn how to compose with them.

About 150 students worked with 10 teachers and experts in the fields of design, representation and visual communication to develop and enhance artistic skills and to communicate creatively and formatively with the world of children.

The workshop was organized in a coordinated manner into ten work groups and took place in a large fully-equipped room, as well as in a multimedia room.

## INTRODUCTORY MANIFESTO

In the final days of the theoretical course, the themes of the ten thematic work groups were revealed and an overall manifesto was drawn up that could give a summary of the contents that would be developed in the three days and the materials needed to realize them.

The ten work groups included from 12 to 20 students each, coordinated by tutors, experts in the field of drawing, representation and visual communication, in order to complete the planned theoretical/practical activities in three days.

## TEACHERS AND THEMATIC WORK GROUPS

Speakers and their topics:

- Marinella Arena: *Astrafavole, narrazioni in geometria (Astrafavole, narrations in geometry)*;
- Manuela Bassetta: *Parolibere, il disegno delle parole (Parolibere, word drawings)*;
- Gianni Brandolino: *Il gioco dell'oca, il labirinto ermetico e la struttura simbolica (The Game of the Goose, the hermetic labyrinth and symbolic structure)*;
- Francesca Fatta: *I teatrini delle figure parlanti: commistioni tra arte e comunicazione visiva (Talking Figure theaters: a mixture of art and visual communication)*;
- Natale Mancuso: *Il teatro delle geometrie volanti: pattern, forme, figure (The theater of the Flying Geometries: patterns, forms, figures)*;
- Andrea Marraffa: *Nobody is perfect, ritratti in movimento (Nobody is perfect, portraits in movement)*;
- Domenico Mediati: *Simmetrie: giochi d'incastro con figure geometriche semplici (Symmetries: puzzles with simple geometric figures)*;
- Claudio Patanè: *City-mending, rammendi di paesaggi urbani (City-mending, the mending of urban landscapes)*;
- Paola Raffa: *Pop-up book, libri in 3D; (Pop-up books, 3D books)*

- Agostino Urso/Francesco De Lorenzo: *Fumetti e filastrocche: processi comunicativi ibridi* (Comics and nursery rhymes: hybrid communicative processes).

## THEORETICAL AND APPLICATIVE CONTENTS

The themes of drawing and visual communication are the first language used to develop and strengthen the ability to express oneself and to communicate in a creative and personal way:

-For observing

To observe and understand an image with awareness, recognize grammatical and technical elements and identify their expressive meaning. Identify in different visual languages the different types of codes, narrative sequences and decode, in an elementary form, the different meanings.

-For expressing

Creatively elaborate personal and authentic productions to express feelings and emotions; represent and communicate perceived reality, experiment with different tools and techniques to enhance the richness of children's spontaneity, their need to assert their own world.

-For understanding

It is necessary to master the grammar of signs and the rules of composition in order to be able to "read" images and "write" with them. Each language has its own rules (painting, comics, photography, cinema, television...). Reading and interpreting in a critical and active way the languages of images with a workshop approach to create an attitude of curiosity and positive interaction with the artistic world.

-For constructing

Develop a hermeneutic process, a construction that is also interpretation and interaction with the object of study. The subject must be involved in a complex reality of which he is a participant. You must learn to produce various types of visual texts and creatively rework the images with multiple

techniques, materials and tools to appreciate the works of art and crafts from different cultures.

THE *ASTRAFAVOLE* WORK GROUP: NARRATIONS IN GEOMETRY  
(Marinella Arena, associate professor)

In this work group, we wanted to explore a playful dimension that, with the “lightness” of games, would subvert consolidated mechanisms of narration and figuration, using simple formal elements according to new patterns that give unexpected and sometimes amusing results.

Borrowing from the experience of Warja Lavater, in her books of fairy tales, and the combinatorial taste of Queneau’s *Exercises in Style* (1947) we attempted to tell fairy tales while considering how the formal, graphic and chromatic choice alters the perception of the story.

During the three days of the workshop, the students designed and produced ten books of abstract fairy tales, called *ASTRAFAVOLE*. The fairy tales, the most classic ones, were told using only simple geometric elements and, by varying the size, the color scale and the arrangement, with a simple combinatorial game, a well-known fairytale was told in a creative and entertaining way.

Fig. 1 Astrofavole work group.



Each book was designed according to a common scheme of 10/20 frames and divided into a number of pages that allows it to open like an accordion. In this way, once the book is opened, all the steps of the frames can be seen. (Figure 1)

### THE PAROLIBERE WORK GROUP: WORD DRAWINGS (Manuela Bassetta, PhD)

Taking its cue from Bruno Munari's book, *Alfabetiere* (1972), the work group invited the students to play with the sounds and shapes of words, cutting out and gluing letters and words to define images referring to the words themselves.

Thought was given to why one learns to read and the methods used to teach a child to read. We retraced the experience of calligrams and wanted to experiment with a fun, creative method to lead children, but not only children, to games, even non-sensical ones, able to create links between letter, word, sound and image.

Fig. 2 Parolibere work group.



The study of letters, of graphemes, in fact, leads us to discover that, in addition to having a sense and a sound related to linguistic conventions, these are also signs drawn on paper and, first of all, they are images.

The work group decided to draw from the calligrams of Apollinaire (1918), the *Parole in libertà* (words-in-freedom) by Marinetti and the pictorial alphabets of Paul Klee and Vasilij Kandinskij, to create “visual texts” with a close relationship between letters, shapes and colors. (Figure 2)

#### THE LABYRINTH AND THE GIOCO DELL'OCA WORK GROUP (Gianni Brandolino, associate professor)

Starting from the famous Gioco dell'oca (Game of the Goose), which has a spiral structure, divided into 63 spaces in which several fixed symbols recur, that leads towards the center, the “goose’s garden,” the goal of an “initiatic sapiential path.”

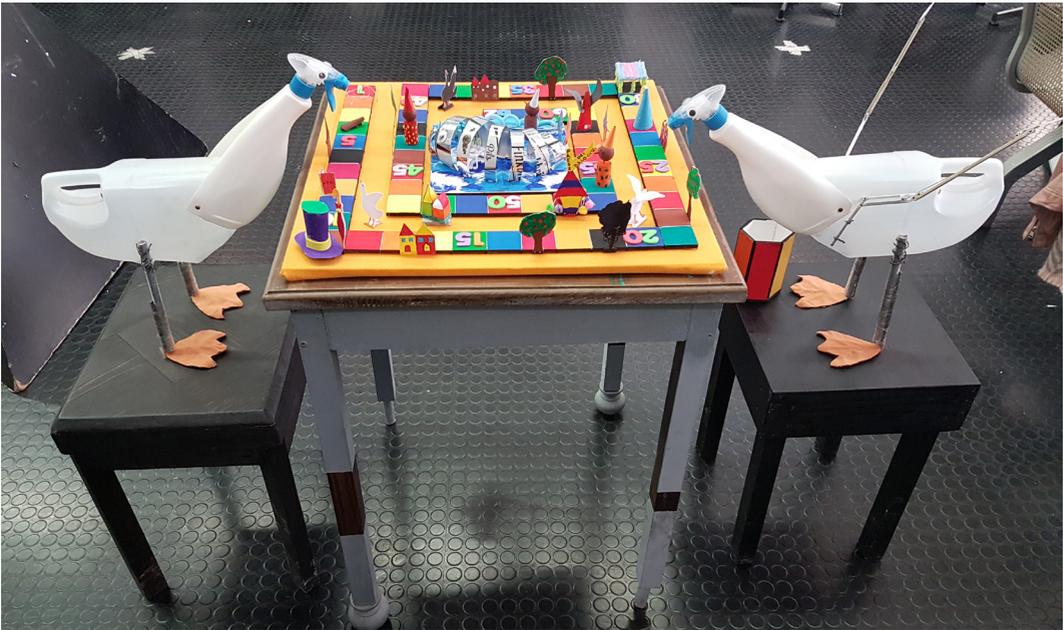
We reflected on the game’s spiral track that always turns counter-clockwise, as if to indicate that the achievement of reaching the center is to be understood as “a climb back to the origins” (Scolla, 2014).

We came to understand the symbolic meaning of the game, which can be considered a symbolic representation of the path of life, and whose symbols describe all the possible stages of human existence.

We then considered the game board itself, that is, the surface where the game is played. A board can be a tablet, a chart, a panel, a plane, a game sheet characterized by squares, borders, lines, boxes, subdivisions, symbols, figures, arrows and writings. On the game board the pieces are moved after throwing dice.

With all this in mind, the work group focused on the recovery of the ancient board game as a metaphor for life.

On the basis of a board with 63 spaces + 1 (arrival), the story of Pinocchio was mimicked, creating a mix of classical and modern pedagogical literature, with a certain dose of



**Fig. 3** Labyrinth and Gioco dell'oca work group.

disillusionment and irony, redefining the accidents (the Cat and the Fox), unexpected events (the Whale), rewards (the Blue Fairy) and –at the end– the coveted goal in the cathartic transformation of Pinocchio into a real boy. (Figure 3)

THE TALKING FIGURES WORK GROUP:  
THE THEATRE OF COMMUNICATION  
(Francesca Fatta, professor in charge of the workshop)

This work group dealt with the reading of images. In the theoretical part, the theme of the emotional evaluation of a work of art was addressed. Subsequently, a higher-level assessment was made, which implied a minimum knowledge of artistic techniques, types of works of art and the historical and cultural periods in which they were realized.

The same was done for a few advertising posters, often created by famous artists or by important graphic designers who are experts in visual communication.

The reading of a work and of an advertisement represent-

ed an opportunity for making images “speak,” even to each other, finding and discovering in art meanings and connections between signified and signifier.

The re-reading of the works assigned, both of a pictorial nature (from the Renaissance to the present day) and of a communicative graphic nature (advertising from the first post-war period to the present day), went through various phases: from the acquisition of preliminary information on a work (type, author, dating, technical data, size, commission), to the analysis of the subject (iconographic and iconological reading), to conclude with the reading of the visual language.

**Fig. 4** Talking figure work group.



On the basis of the manual redesign of the visual composition, the elements of this language (shapes, lines, figures, colors, light) were redrawn, then moving on to the structures (configurations, weights, lines of force, rhythm, symmetry).

Finally, in a creative and arbitrary blending, a small theater was created (20x20x20 cm) in which the combination of painting and communication brought into play elements of the foreground, those further back, and finally the background itself, as if to recreate a spatial dialogue between parts of the representation. (Figure 4)

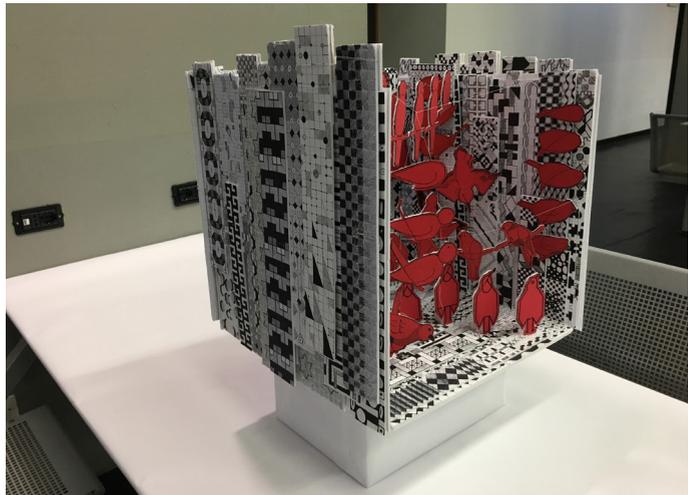
THE THEATER OF THE FLYING GEOMETRIES WORK GROUP  
(Natale Mancuso, artist)

The work group's aim was to guide the student to the conscious use of geometric scanning in space, working in three steps.

The first step was a simple exercise on a square sheet of A4 paper (0.5 x 0.5 cm.), a plane surface with a rigid, pre-defined grid, within which to move according to constraints and freedom. Inventiveness, ingenuity and inspiration were the premises from which we started to create real patterns drawn with fine-tip black markers.

Each student, initially forced into a limiting and obsessive context, once they had taken possession of the theoretical grid, creatively tackled the filling in of the spaces, creating increasingly complex patterns.

**Fig. 5** Theater of the flying geometries work group.



The next step was to use the sheets of paper with the drawings of patterns to cover the inside of a foam board structure measuring 50x50x50 cm. The decorations glued together, defined the walls and the floor of an ideal geometric theatre; a total black and white covering with an optical graphic result. The third step served to break the obsessiveness of the black and white and of the basic grid

thanks to the composition of a few animal shapes consisting of simple geometric figures realized on red cardboard, suspended between the walls of the box. The final effect of the collective composition was a sort of “aviary theater” animated by mobile figures. (Figure 5)

THE NOBODY IS PERFECT WORK GROUP.  
 FACES, SYMMETRIES AND PROFILES  
 (Andrea Marraffa, PhD)

This thematic work group dealt with the study of the human face: symmetries, asymmetries, canons, golden proportions, profiles, were the theoretical-methodological tools through which each student tried to break down his own face, analyzing every little nuance and possibility of combination. Starting with 15x15 cm black and white photographs of each participant’s face, one frontal and one in profile, they experimented with mirror games

**Fig. 6** Nobody is perfect work group



(the reflection on a central axis of the right and left half of their face); the redrawing of the missing half (left and right) of their face (mixed photo/drawing configuration); the definition of the main geometries that dominate their face; the portrait of each other, the self-portrait from memory, and in the mirror, of their face.

During these exercises, the mnemonic and associative capacity of each participant was tested.

On the last day, a second practical exercise took place, in which the participants tried to condense what they had learned, synthesizing it in a plastic composition (papier-mâché sculpture), based on the theme of face masks, to create bizarre, grotesque and apotropaic figures. (Figure 6)

#### THE SYMMETRY GAMES WORK GROUP

(Domenico Mediati, research professor)

This work group proposed a study on the theme of tessellation of surfaces and of space. Some essential notions about symmetry movements, tessellation techniques and the use of these geometries in art and decorative works over the centuries were provided, with particular attention to the experiments of M.C. Escher.

The aim of the work was to acquire the ability to interpret geometric structures and decorative motifs and then propose them again through experiments in edutainment, that is to say, games and learning.

During the three days of the workshop, drawings and motifs taken from Escher's works were created, using decompositions and recompositions of the constituent elements of complex graphic textures. In this way, both flat and three-dimensional puzzles were created, useful for understanding the rules and potentials of periodic repetitions. (Figure 7)

**Fig. 7** Symmetry games work group.



### THE CITY-MENDING WORK GROUP (Claudio Patanè, doctoral student)

The aim of this work group was to encourage the participant to listen to the city in which he lives in a new “perceptive and conscious way.”

The context the student dealt with was that of the urban space he crosses on a daily basis, and he was stimulated to make an active experience of it, “pinning” and “mending” those invisible plots and connections, which involve his body, his mind, his memory and the places he perceives when he passes through them.



Fig. 8 City-mending work group

Discovery, play and invention were the ingredients of this new narrative, aimed at training future teachers to encourage future generations to take a more sensitive and emotional approach to what surrounds them, to unveil reality starting from a careful, curious, sensitive, playful gaze like that of Calvino’s *Marcovaldo* (1963), during his “seasons in the city.”

Borrowing the experience of “mending” present in the work of the artist Maria Lai, the students were guided to investigate the everyday urban landscape and, like the artist from Nuoro, to transfer the sensations, visions, colors, materials and spaces into final works, into “works of art,” thus bearing material witness to

the actual passage from what they had encountered and consumed through observation. (Figure 8)

#### THE POP UP BOOKS WORK GROUP. 3D BOOKS

(Paola Raffa, research professor)

The work started with the consideration that a pop-up book is an animated artifact with movable and transformable pages. A book whose form is subject to modification and movement and whose language is expressed in a tactile communicative space. The reader becomes an observer of episodes narrating events that can be transformed by activating mobile devices. It is a hypertext in which the transmission and reception of information are different from the alphabetical text; they refer to visual, tactile, olfactory and sound

**Fig. 9** Pop up books work group



components. The traditional communicative canon is modified and information is communicated through an intuitive and experiential metalanguage.

The work group's aim was to design and produce pop-up books for communication, learning and teaching in primary schools. Books thus became the object of a project in which content, visual aspect, choice of materials, graphic rules and overall readability tend towards interactive expressive codes. (Figure 9)

#### THE COMICS AND NURSERY RHYMES WORK GROUP: HYBRID COMMUNICATIVE PROCESSES

(Agostino Urso, research professor and Francesco De Lorenzo, PhD)

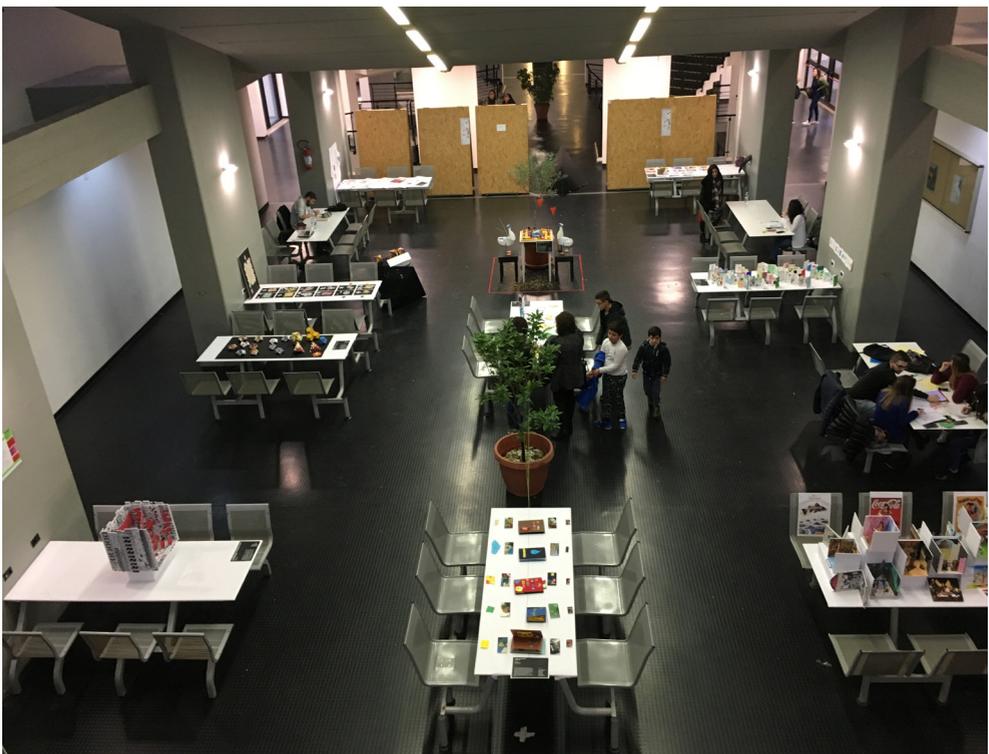
In this context, a reflection was conducted on new and original ways of hybridizing different artistic media with the aim of creating original communication tools. An operation that can be accomplished, in this case, through the concurrence of two mediums: drawing (the graphic sign that can be expressed through the use of comics) and writing (in this case through Rodari's nursery rhymes), to which a conceptual space of reference (the graphic grid) is added, on which the first two rest.



**Fig. 10** Comics and nursery rhymes work group

**Fig. 11-12** Final exhibition.

In short, an attempt was made to expand the need to communicate the themes investigated through the use of an immediate, synthetic, dynamic language. That is, an attempt to deal with a new audience of individuals – the so-called digital natives – not



necessarily accustomed to the rigidity and formalism typical of academic languages.

Each student reinterpreted a nursery rhyme by Gianni Rodari in a graphic –and therefore reinterpretedative– key agreed upon with the teacher using the technique of “collage” for overlapping, contrasting and juxtaposing freely identified, selected or constructed images and/or drawings. From the realization of a storyboard, to the construction, research and graphic implementation of all the individual drawings and/or images provided, the work concluded with the final editing and digital printing of the 8-page comic book, including the cover. (Figure 10)

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# RESPONSIBILITY OF THE IMAGINATION

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## ESSAY 10/01

IMAGE THEORY  
IDEATION TECHNIQUES  
MORPHOLOGY OF THE ARTIFACTS  
ARCHAEOLOGY OF THE PRESENT

From a “manifesto” –textual genre of the “activist” or “revolutionary document”– we expect a declaration (often without any justifications) of aims and procedures to implement a “different” vision compared to a given situation, and we expect above all the indication of the actual stakes.

Here the “given situation” is that of the studies on representation cultivated in design schools, studies that are documented by a vast scientific literature with its unstable boundaries between “design studies” and “visual (cultural) studies”, between “techniques of the (graphic and eidomatic) representation” and “sciences of perception and cognition”. But what is at stake in this dispute among knowledge boundaries on

the practical ground of the technical and artistic project? I believe that these “stakes” consist, first of all, in knowing why our artefacts for aesthetic use have the shape they have, but I do not believe that a satisfactory answer may come separately from history or from the natural sciences.

Anyway, we must give an answer here because the question has its own essential necessity: we cannot avoid it because it guides (in an ethical way) our design activity by modelling our ideation techniques.

The answer that I present here is biographical and assertive: it proposes a “Simondonian” manifesto, that is, a horizon of the task that must be a matter, in our opinion, of the discipline of “Disegno”.

## MORPHOLOGY OF ARTIFACTS AND ARCHAEOLOGY OF THE PRESENT

In the mid-nineties I left my professional career as an architect almost at its beginning to focus on “*Disegno*” [drawing for design] intended as a technique for the conception of artefacts, and as part of that long tradition of studies that the naturalist D’Arcy Thompson summarised with the Goethian term “Morphology”, intended as the «Science of Form which deals with the forms assumed by matter under all aspects and conditions, and, in a still wider sense, with forms which are theoretically imaginable» (Thompson, 1942, p. 1026).

This idea of a “morphology” as “science of the possible shapes” can be suspected of total naivety: it includes everything by explaining nothing. However, it should be noted that, according to D’Arcy Thompson, morphology is an absolutely “materialistic” discipline; it concerns only the matter in itself, since he rejects the dualism of form and matter or any distinction between soul and body.

As Gilbert Simondon will better explain at the beginning of the main of his two doctoral theses, the notions of “form” and “matter” indicate nothing but two opposite orders of magnitude –the inter-elemental and the infra-elemental ones– with which we get to know the same physical individual. Therefore, the “morphology” as “science of the only possible shapes” is not a psychedelic delirium of hallucinatory images. On the contrary, it is a careful critique of the feasibility of the possible implemented through a particular exercise of the imagination. It is a “science of the necessary and the potential” that presupposes a full “realism of the imagination”, namely the ability and the adequacy of imagination to grasp the limits that the incorrigible reality tightens around the facts and the feasible.

Trained as an architect, I was particularly interested in the limits that physical and historical reality imposed on the meaning of buildings and urban artefacts. I was not so interested in the history of architecture and the city, rather I was

interested in their underlying morphologies, or, better said, in their “archaeologies”.

Let me explain. My interest in architectural and urban morphologies was essentially practical and political.

By dealing on the morphology of objects I thought I had only postponed the appointment with the construction sites in order to study aspects of a much wider site. Cultivating a little more my passions as a student trained in the previous decade through Gramscian readings, I believed that, even in the concrete (artistic and technical) design practices, the real issue was ideological and political criticism. My (perhaps unrealistic) ambition was to work as a designer in a different way compared to the professional one: by making the archaeology of the current design knowledge that operates in the various forms of design and in the production of aesthetic artefacts.

By “archaeology of knowledge” I literally meant the one outlined by Michel Foucault in the homonymous 1969 text –*Archéologie du savoir*– that, since my passionate reading during the first year of university, has offered me the point of view through which I approached the courses at IUAV that really trained me –those of history and aesthetics held by Giorgio Ciucci, Manfredo Tafuri, Franco Rella, Paolo Fossati and Massimo Cacciari– and that asked me (karst) questions to which, in the following decades, I sought answers, especially in the “semiotics of discourse and practices” formulated by Jacques Fontanille (2003, 2008) and in the theory of iconicity by Jean-François Bordron (2011).

In short, in more than a quarter of a century, my research has been carried out as if had to meet two appointments: i) as if Foucault’s archaeology of knowledge (1969) had given an appointment –forty years later– to Fontanille’s semiotics of practices (2003, 2008), that is the generative model of the expression plane; ii) as if the Morphology of D’Arcy Thompson (1942) had given an appointment –eighty years later– to René Thom’s Semiophysics (1988), that is, to a “Morphology of the artificial”.

These two “appointments” between discourses very far apart may seem delirious, but I will –in paragraph 2– explain

how they are possible thanks to the mediation of Simondon's thought. Meantime, it is not easy to briefly explain why I believe that the concrete discipline of "Disegno" is based on a semiotics of the visible, somehow already implicit in Foucault's text. First of all, it must be remembered that Foucault's "archaeology" was proposed as an essentially political and Enlightenment-based point of view –although it is inscribed among the fury of a post-modern Nietzscheanism– focused on the "ideological" theme of the relations between "knowledge and power", trusting (from an "enlightened" point of view) in the critical (deconstructive) and emancipatory (constructive) power of rational and positive (documental) knowledge.

That particular type of "knowledge" was called "archaeology" precisely because it dealt with the theme of the relationships between "knowledge and powers" not as much in the dimension of the "history" (of the epos, of the story) as in that of the "genealogy", that is, of the archaeological reconstruction of the networks of concrete technical lineages between discourses, practices, conceptual devices, procedures, institutions. In other words, making the "archaeology of the present" meant to suspend the authority of the great historical and aesthetical tales, forcing oneself to the naked positivity of the document, to its "traceability", thus safeguarding –as "images" and not "words"– the network of possible relationships between the bare finds of history.

Since the finds on which this "archaeology of the present" works are relationships between physical objects and social objects –between performances and competences, between bodies and documented knowledge– it was completely logical for me to use an "archaeological" point of view in order to analyse the (more or less historical) objects of our present –the city, clothing, home, tools, parks, cockpits, works of art, museums, hospitals, ...– and the "skills", the practices, scenes, of their use in the social domains of arts, architecture, design, religion, everyday life, etc. Therefore, dealing with "Disegno" I have done nothing but alternate and correlate historical

and empirical research on real aesthetic artefacts – especially by drawing and studying the genesis and reception of architectural artefacts – to theoretical investigations into the categories and models that try to explain why those artefacts “have the shape they have”, identifying the aspects of those shapes that allow the functioning of the valences on which the current valorisations of those objects are played.

These studies led to concrete and specific results, plausible in each case and, in their episodic and chaotic tangle, highlighted the need for a unitary theoretical background.

#### A REALLY GENERAL THEORY OF IMAGES

The text that –considering it fundamental– I would place at the top of the short bibliography of my presentation is “*Imagination et invention*”, the concise summary of the psychology course that Gilbert Simondon held at the Sorbonne in 1965-66 and which can now be read in a new 2008 edition. It is a surprising text because it treats the image as an intermediate reality between a being and the world and it deals with that in all its phases and modes of existence, both in individual organisms and in social communities. It begins by defining the embryonic mode in which the image consists of a “scheme of action”, which is self-generated in the pre-conscious psychic life of a living being (or a machine), before perception and environmental adaptation.

This is an “*a priori*” image that only then, during the environmental adaptation of the organism, can become a real “infra-perceptive” image, that is, “*a presenti*”. In this infra-perceptive stage “image” is a form of reception of environmental stimuli in the perceiving subject while he interactively learns his internal and external environments. Here the image becomes a plurality of images –in the different sensory formats– integrated in order to form, for the organism, an *analogon* of its environment. In this phase of its being, the image is a sort of “model” in continuous stabilization. For the

subject, during the reticular stabilization of models and categories of the world, the images are memorized as facts that are valid “*a posteriori*”, they properly become emotional-affective “symbols” of the experiences that generated them; they constitute the materials on which the imagination works, producing, in its inventive activity, “anticipatory” images, that is, still valid “*a priori*” to guide the action.

Simondon thus describes the complete cycle of the phases of existence of the image, from its neurophysiological origin to its individual and collective memorization, up to its physical and documental concretization in (physical or ideal) artefacts, in objects and world events. Each “conceived” object derives from technical genealogies of ideas (images) and makes itself their bearer—for better or worse and because of images—participating in the phylogeny of the artificial.

On the phylogeny and ontology of technical objects, Simondon had published, eight years earlier, his most famous pages: the dazzling thesis *Du mode d'existence des objets techniques*. But with the course on *Imagintion et invention* he marks a further step: he includes in a single vision the ontogeny of the image and the phylogeny of the imagination, clarifying how images become “social objects” —as they are intended by Maurizio Ferraris (2009)— or —according to Eco (1997)— “cognitive types”. In other words, Simondon clarifies how “ideas” exist and evolve regardless of us —not (platonically) *a-priori*, but *a-posteriori*— just like natural species. As a consequence, “ideation” is not infinite and unconditional fantasy, but it is the —responsible or irresponsible— exercise of the design imagination that is measured according to the incorrigible and unique reality of ideas.

#### THE HORIZON OF A PRACTICAL (ETHICAL) TASK

As Belting’s anthropology of images (2004) and Simondon’s techno-aesthetics (1992), above all, made it clear to me, many aesthetic artefacts function as “image-objects”, that is,

as bodies conceived or used as a support for images intended as “social objects”, not only and always as representations.

Thus, understanding the meaning of these “image-objects” is something that, in my opinion, concerns the informative specificity of *Disegno* – an activity that in turn produces other image-objects – and forces the research on *Disegno* to oscillate between bodies and theories, between “physical objects” and “ideal objects”, because this is the only way to grasp them together in their unique and incorrigible reality of “social objects”. The Morphology of the artificial is “Really” an archeology of knowledge. This is, therefore, the reason why I deal with *Disegno*, intended as the study of the responsibility of imagination, based on an adequate theory of “images” as “social objects”.

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# ON PHYGITAL REPRODUCTIONS NEW EXPERIENTIAL APPROACHES FOR CULTURAL HERITAGE

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## ESSAY 11/01

PHYGITAL HERITAGE  
DIGITAL COPY  
DIGITAL ENVIRONMENTS  
MUSEUMS

The essay offers an opportunity for reflection on some topical issues based on a critical analysis of the different interactions between Digital and Cultural Heritage. Firstly, we discuss some possible actions which will aid in improving storytelling through a blending of the material and digital, also known as Phygital Heritage experiences. The second theme discusses the advisability of using

new technologies more effectively to receive data and not just provide it, in order to make museum spaces and installations more interactive. Finally, the quality and the value of digital copying is commented upon through the thoughts of authoritative scholars, and also through the description of some experiments which were aimed at merging science and humanities, art and technology.

## FOREWORD

I have been working in the digital field for about 15 years, devoting particular attention to the construction of 3D models for architecture through the use of BIM approaches that allow the integration of data and geometries within digital environments mainly used in the design field. However, in the last five years I have been working on understanding the process of the creation of interactions between the real world and the virtual one, while also working on the possibility of memorizing information derived from the recording of construction site data and bringing it back into the digital environment for greater process efficiency (Lo Turco & Bocconcinno, 2017). At about the same time, perhaps due to taking up employment at the School of Architecture of the Politecnico di Torino, the attention towards Cultural Heritage has grown, from which I have derived research experience aimed at redefining the undeniable benefits, previously summarized in a context which is more complex and better-articulated. However, I would rather focus on the most recent research published concerning the use of museums, with particular regard to research which refers to the relationship between the physical object and its (complementary) digital representation: by blending together the digital skill of cultural learning, entertainment and storytelling with heritage artefacts, activity or environment, heritage constitutes a very interesting field which can give meaning to new and dynamic digital experiences (Nofal et al., 2017).

## CULTURE & DIGITAL STRATEGIES

As Ch'ng states, the value of material culture is based on both its physical and immaterial values. These include the aesthetics and authenticity of the object and its condition and quality, along with the intangible values associated with the artefact, such as its symbolism and origin and the histori-

cal development: these characteristics and events contribute to the uniqueness of the object (Ch'ng, 2019).

In accordance with the recent trends which have been moving towards the democratization of culture, we have a general aim of making heritage information more accessible to an ever-widening public audience. And how can we achieve this without the contribution of digital technologies? With regard to the contributions of digital technology to material culture, Antonio Lampis reminds us of the European Union's decision to launch the European Year of Heritage 2018. The work contains a strong reference to the need for a stronger connection to be developed between artistic heritage and the younger generations: the new generations are endowed with great visual skills, body movement skills, rapid reasoning and strategy, all of which is often connected to and developed through the use of video games (Lampis, 2017). These are habits which contribute to the elaboration of cognitive processes and organization of knowledge and perceptive mechanisms, which were completely unknown to the previous generations. These processes are, however, a source of great opportunities for understanding the symbols of the artistic heritage, and must be taken into consideration in order to overcome the static nature of some museum itineraries: some of which are not equipped with multimedia support and are therefore incapable of attracting the involvement of this section of the public (Ferri, 2011). In what ways and contexts can digital strategies (and the products derived from it) be effectively used?

Today, we are fully "immersed" (never was the term so apt!) within the much praised digital revolution that has already transformed our cognitive approaches and the ways in which we work. The use of photogrammetry and 3D modelling has become increasingly accessible, and digital communication allows us to create virtual work environments in which researchers from all over the world can work together and compare their data. It is clear that the new visualization techniques that characterize many digital acquisition proj-

ects, from high-resolution 3D scans to the use of drones, and the subsequent transformation of these new data sets into real objects presented on interactive screens or as 3D prints, allow much more than just enabling us to “see” ancient works in more detail. These tools have become part of a broader policy of “seeing” which is of considerable interest not only for disclosure, but also for dissemination and research.

In this regard, museums must provide new solutions for how technology can truly support new and collaborative forms of interaction.

Today, therefore, it is possible to reconstruct objects in both virtual and material forms. It should be noted that the “technical reproducibility of the work of art”, as described by Walter Benjamin and which has now been widely investigated, has reached a level of true excellence: the reproduced artefacts can no longer be considered simple “faithful copies” of the original but representations of “identical originals” from time to time. However, as Ch’ng himself points out, when digitized, the authenticity and value of the copy of the original appears to be lost, for the copy can now be edited, reproduced and distributed at little cost. The Manichean position of the original at any cost is no longer valid: if you want to understand and read the past, you must accept the importance and value of the copy. This will be discussed further in the following paragraphs.

Considering the artefact as a mere historical document or as a surviving witness of a distant and disappeared world does not do full justice to its value. With regards to reconstructing the biography of an artefact displayed or stored in a museum, one cannot overlook the value of the archives that document the history of its acquisition in an antique market or of its archaeological discovery. And it is precisely their direct relationship between different information systems that, if properly digitized and classified, could undoubtedly lead to it gaining added value.

Each object contains in itself a multitude of information, some of which is more hidden, that can be revealed and told

through a complementary narrative structure that draws heavily on digital technology and that allows one to find the answers to a whole series of questions that look at the history of the object itself. In the following paragraphs, we propose three different themes which, although apparently unrelated, are connected by the tension of identifying new experimental approaches for promoting and better understanding Cultural Heritage.

#### ISSUE N.1. FROM PHYGITAL RETAIL TO PHYGITAL HERITAGE

The term Phygital is a neologism that can take on different meanings. In a more humanistic sense, it can be used to indicate a generation of people for whom the real world and the digital world overlap. In a more technical context, it is used to define the interconnection between the physical and digital layers that increase the meaning and value of the original object.

Many case studies have been focused on the field of retail: large companies are at the forefront of finding ways to enhance customer experience through ensuring immersive involvement, stimulating various senses, offering useful content and arousing strong emotions in the customer. The virtual dimension becomes increasingly involved in every moment of the purchasing process: from web marketing, to the immediate availability on the web of information and product reviews and to the integration of digital technologies in physical stores. But as it often happens, some considerations, processes and activities designed for the commercial field can be usefully declined in the field of Cultural Heritage. If instead of products, you think of museum collections and instead of shops, you think about the exhibition rooms that contain them, the difference is minor. On the other hand, it would not be the first time that a cross-fertilisation of knowledge and experience is witnessed: for example, like the relationship between applications used to create cinematic ef-

fects and video animations used in the more popular field. There is an equally close relationship between the real-time rendering engines of video games and those used to make the animations, used to set up increasingly photorealistic navigable scenarios. In recent times, the connection between architecture and the videogame environment is even closer, as well as that between gamification and Cultural Heritage.

To summarize, we can say that every time a physical object is connected to a digital platform to become a carrier of information in relation to which actions and experiences are triggered, we are in the field of the phygital.

In this regard, we must mention a very interesting contribution by Eslam Nofal, published in his PhD thesis, which describes in detail the most relevant qualities that a digital medium can include: providing access to a rich and vast form of information / personalization of information; information immersion / psycanalization / situatedness. The above-mentioned characteristics have been combined within a proposed “phygital heritage” model, mapped along two axes: the physical affordance of information and the level of how this information is communicated (Nofal et al., 2017). Beyond technicalities, in order to maximize the effect it is appropriate to know how perceptive mechanisms work; for this reason, some considerations relating to the relationship between neuroscience and museum institutions are summarized below.

## ISSUE N. 2. HUMAN BEHAVIOUR: NEUROSCIENCE & MUSEUMS

For about ten years now, new technologies have been used in museum design and exhibitions to make a decisive contribution towards promoting knowledge and culture.

New digital visualization processes are expanding the ability of museums to define new experiences of the perception of cultural heritage. In the book *Museum Object Lesson*

for the Digital Age, the author argues for the need to include the proliferation of digital projects in museums in a broader historical context (Geismar, 2018), thus opening up new possibilities for understanding the collections. As mentioned above, in addition to 3D scans and prints, there are also applications of virtual and augmented reality available; machine learning and artificial intelligence experiments are working in parallel to bring alternative educational scenarios into the sphere of museum collections, changing our understanding of what could actually be learnt from the collections.

From the analyses of some experiences conducted by fellow pedagogues with whom we share the cultural project of the magazine, we have found that the technologies of VR and AR can have a fundamental role in the enhancement of a second heritage: knowledge, reworking and participation (Panciroli & Macaudo, 2017).

With reference to the experiences of Phygital Retail as described above, it is interesting to remember that through the use of integrated technological systems, it is possible to acquire enormous amounts of data (big data) concerning the use of stores by customers: including the time spent in the various sectors, products that attract more attention, products that are sold in higher numbers. Regarding a possible application in the context of Phygital Heritage, it can be observed that the exhibits collected in museum spaces are characterized by formal values and “less measurable” values: the latter are attributes that are generated over time and derive mainly from the historical, artistic, social and media that have characterized the exhibits, which are informal properties as important as the formal values of the work. The relationship between these values can help to create an attractive impact for the work of art within the exhibition project and therefore become the subject of analysis for a correct prefiguration of visitor flows. We are looking for automated procedures with which to show, through graphic representations, the complex phenomena triggered by the attractive weight of the works on display. The elements that come into

play here are the space (the graphic field), the collection (the attractive elements) and the users. The procedure devised, once automated, can become a product which can support the fitter to control the design of the fitting-out and possibly make it more efficient as compared to the quality of the objects on display. This procedure can be validated through the real registration of the users' behaviour for ex-post analysis and for the verification of congruity with the proposed forecasting phenomena (Lo Turco & Calvano, 2018). Now that neuropsychology and psychology of perception have, albeit partially, provided some models of the mechanisms that govern the fruition of an object with an artistic content or aesthetic value, the curators of museum installations cannot ignore this knowledge. In recent years some museums such as the Peabody Essex Museum in Salem, Massachusetts, have started exhibiting interesting experiments, including those by the neuroscientists in the working group that designs the museum displays: its aim is to make the experience more engaging and intense using digital aids (Robertson & Mack, 2017).

Even the Egyptian Museum, in its recently opened temporary exhibition entitled "Invisible Archaeology", has decided to entrust to digital media the history of the objects displayed and the scientific techniques used to discover their secrets: thanks to neuroscientific studies we know that, from the cognitive point of view, they are tools which are complementary to the exhibition of the original. They are useful to give experience that completeness that only access to knowledge, to the so-called semantic memory of the object is able to provide. This approach facilitates but does not replace the emotion aroused by the original, even when using immersive techniques such as virtual reality or interactive mechanisms such as those used in gamification techniques.

The paradox of fruition based on the concept of learning through interaction allows us to overcome traditional modes of the presentation/observation of heritage through display cases, thus stimulating the visitor to become an active spectator and making him the protagonist of the object in his vi-

sion. In fact, he will be able to navigate the 3D model, turn around it, touch it, manipulate it, investigate it, activating different multimedia and complementary contents on the same physical object (images, texts, videos). At the same time, it is possible to guarantee a better use of valuable goods, as when they are observable only through display cases, the appreciation of their value and the knowledge of details about them becomes greatly limited (Clini et al., 2017).

The experiential intensity of the visit is therefore enhanced. Thus, they will find more and more place in museums, in support of the pleasure we feel in finding before us an object that has come down to us from past centuries through countless risks and hardships (Ovadia, 2019). Certainly the cognitive landscape linked to digital environments and the complex narratives that can connect one, especially the very young, to the artistic heritage that they have in common along with a constant expectation of the evolution of the story regarding an artefact: an expectation that today, as stated previously, is not satisfied by static installations and works of art in museums and archaeological parks, and even less by the stillness of the stories presented in the vast majority of museum rooms and archaeological parks and on which there is much work to be done. In this scenario of “enhanced” fruition, it has been repeatedly stressed that a two-way dialogue between the real and the virtual is strategic. However, the difference between the original and the copy (understood as the real result of a digital elaboration) is now more nuanced and is worth taking into consideration.

### ISSUE NO. 3. REAL, VIRTUAL, AUTHENTIC, COPY

Let us take a step back. It has been said that the value of an object also lies in what we know about its history: where it was found, what road it took to get to the room in which it is currently exhibited and what restorations it has been subject to. For the same reason, we are willing to work for hours

in a row to see an original object, while we do not think to go and observe a reproduction instead, even if the difference between them is indistinguishable to the eye. For now, that is the case. But the crucial question is: will digital artefacts ever hold the same value? Are concepts of value in the real world transferrable to the virtual world?

These new digital products are a challenge to the existing models of testimony and authenticity that are the basis of our experience, especially in museums. They ask us to rethink our cultural codes and the policies that underlie all visual systems. Who produces the data that creates the new images? And with what authority? To date, the contribution of information, even from those who collect and analyse data, has not been traced within the history of digital objects. Therefore, just as the task of museum anthropology consists of recovering these lost stories and bringing out the complex socio-political grids that are the basis of the constitution of the collections and their exposition, digital anthropologists are called upon to do the same with the new digital products. There is an interesting book on this subject entitled *Copy Culture: Sharing in the Age of Digital Reproduction* (Cormier, 2018) which poses the following argument about these instances: “Should we or should we not copy?” The question is, “What should we be copying and for what purposes? And that inevitably brings you to political questions.”

Quoting Cormier, Ch'ng is of the following opinion regarding these themes: “Reproductions has a very real currency”. Aguerre and Cormier stated, “The proliferation of images of works of art, in fact, has become a significant driver for going to museums – the opportunity to see the original, finally, after having seen the reproduction so many times over” (Cormier, 2018). Whilst copying has become a positive activity, digital copying is in urgent need of a mechanism for securing ownership. The question therefore arises of the authenticity of not only the object itself but also of the digital product used to give structure to the data, in search of a code of guaranteed authenticity.

Over time, replicas can also take on the role of the original and perhaps replace it (Ch'ng, 2013). Do digital copies have the same value as the originals? There is no simple answer to this question, at least until the digital has completely mediated our physical world and digital content is consumed with the same fervour as physical objects, and when signs and symbols replace and simulate our reality. The precession of simulacra may already be at work (Baudrillard, 1994).

We can agree that, apart from the tangibility of digital copies, there are no differences in their appearances. Moreover, physical artefacts are not as accessible as their digital replicas. One thing is clear: while the intrinsic value of a copy is not equivalent to the original, the instrumental value of the copy is significantly higher. If two values are put together, the combined value may become greater than the original.

## CONCLUSIONS

The article does not provide all the answers regarding this subject, but it raises questions and offers food for thought on some topical issues that have as their common thread the critical analysis of the different interactions between Digital and Cultural Heritage. The first discusses possible actions which can be taken to improve narration through a blending of the material and digital. The potential of the application of innovative technologies to the indispensable revision of the stories connected to museum collections and to the necessary radical revision of the installations is immeasurably valuable. Rigour in their application is certainly needed so as not to run the risk of a simplification which may lead to trivialisation.

On the other hand, most curators and other professionals base their training on traditional museology. The new generation of art historians and archaeologists must therefore work with the new languages that deserve to be able to be expressed once again by being more involved in the necessary renewal process in museum institutions.

At the same time, the second theme is aimed at thinking about the opportunity to use these new technologies more effectively to receive data and not just provide it, in order to make the spaces and installations of the museum more efficient. In the direction of language renewal itself, there are some research paths to which the best university must turn. These are central themes on which our scientific community is questioning itself, in the different forms that a university structure can take, starting from its first mission of teaching, where we witness the first experiments of the merging together of science and humanities, and art and technology.

The third important reflection is on the quality and value of digital copying: the solution to the fundamental need to identify, classify and authenticate digital copies has crucial implications for the permanent digital documentation of cultural heritage, especially when damage, erosion, abandonment and destruction by anthropogenic risks and conflicts threaten our physical cultural heritage (Ch'ng, 2019).

At the same time, a rethinking of the role of art historian and archaeologist will make possible the creation of digital environments that leave time and opportunities for direct confrontation with the original work: moreover, it create effective opportunities to get, from home or school, some information tools to prepare one for the discussion with the works of art or the tools for ex-post analysis.

As for the role of the museum, there will certainly also be new forms of cultural enjoyment. Their task will always be to improve the visual, aesthetic and intellectual experience of each visitor when he is faced with an artefact of the past, and to attempt to provide all the information necessary to enrich his understanding. Therefore, the future of museums, as has always been the case, is research (Greco, 2019).

The scientist and the humanist must work more and more in tandem to try to unravel the complexity of the contemporary world. Increasing collaboration that goes beyond the dogmatism of individual knowledge, and the definition of a shared semantics and development of a true multidis-

ciplinary approach are the methods we have in order to face the challenges of the future.

As Luigini recalls in his preface to the book *Ambienti Digitali per l'Educazione all'arte e al Patrimonio – Digital Environments for Education to Art and Heritage*, on the one hand are scholars of representation who have always been largely involved in the documentation and enhancement of heritage, and on the other, scholars of pedagogy of the arts and museum education who seem to forge two sides of the same coin: in particular, it is applied technology that presents itself as a “mirror” in which scholars of representation and pedagogues reflect, look at and resemble each other, and digital technology that is applied to arts and heritage (Luigini & Panciroli, 2017).

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# NOTES ABOUT INTERDISCIPLINARITY AND TRANSDISCIPLINARITY OF IMAGES

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## ESSAY 12/01

IMAGE  
IMAGERY  
IMAGINATION  
VISUAL STUDIES

This article is composed of a succession of notes, linked by the commonality of the theme but not by a narrative consecutio, developed over the past two years on the theme of the multifaceted nature of the world of images. Some - 1 and 3 - are notes on readings on the theme, while others - 2 and 4 - are reflections on the study of images. Some of the contents have been anticipated and developed more extensively in the introductory essay to the proceedings of the IMG2017 conference - *IMAGES? International and interdisciplinary conference on image and imagination between representation, communication, education and psychology* (eds. Luigini et. al., 2017), to

which we refer for further details.

The first note is about how images strip us bare and the need for an interdisciplinary gaze. The second is about the multiplicity of images that interest the magazine. The third is about the genesis of visual culture. The fourth is about the relationship between image, imagery and imagination.

The article wishes to present, synthetically, the discreet process that leads from degree zero to the acknowledgment of the theme's complexity, to the recognition of a cultural tool that may help to explore it in greater depth, to finally assert the (plausible) solution to the initial question: how to investigate images?

## 1. STRIPPING BARE

Georges Didi-Huberman in his *DEVANT L'IMAGE. Question posée aux fins d'une histoire de l'art* (1990/2016) states that it is important in approaching an image to create a space between our previous knowledge, categorized and characterized by different types of knowledge, and the moment in which the gaze, our gaze resulting from our experiences, poses itself on the image. Didi-Huberman talks about this cognitive moment in a recent interview:

*«The appearance of an image, regardless of its “power” and efficacy, “invests” us and so “strips” us bare. [...] to be in front of the image means both to question knowledge in order to put it back on the table. We must not be afraid of no longer knowing (as the image strips us of our certainties), nor of knowing more (as we must understand the stripping itself, understand it as something greater involving the anthropological, historical or political dimension of images)»* (Eco, et al. 2015, p. 56)

The intangible substance of the image is the optimal infrastructure for the imagination, understood as the construction of image-syntheses of eidos and eidolon (Cassirer, 1923/2009) which occurs mainly as the “making of imagery”, to come full circle in the triptych of terms that identify the nascent magazine.

On the other hand, the process of perception that makes the signifying significance of the image tangible is underlined by the substantial equivalence - i.e. equivalence of value - between the act of seeing and the act of imagining proposed by Merleau-Ponty (2003), detaching itself from the Cartesian statute of the distinction between Knowledge and the World. The ontological primacy of perception in Merleau-Ponty leads us to rediscover how the world, in our intent a world made of images, is indissolubly related to our body:

*[...] we are in the world through our body, insofar as we perceive the world with our body. But by thus remarking contact with the body and with the world, we shall also rediscover ourselves, since, perceiving as we do with our body, the body is a natural*

*self and, as it were, the subject of perception.* (Merleau-Ponty, 1945/2002, p. 239)

Merleau-Ponty's overall vision also differs from Sartre's substantially negative vision of the imaginary (1948/2007), in which the enunciation of the illusion of immanence, on the other hand, seems significant for our purposes, in recognition of the transcendental character of images and the experience of them: in adopting Husserl's theory of intentionality, Sartre proposes a vision in which the image is not a thing but an act of conscience. Although these positions are two distinct interpretations of Husserl's phenomenology, we believe they can contribute, together with Didi-Huberman's stripping bare, to identifying the centrality of the moment in which the image interacts with our gaze.

## 2. MULTIPLICITY

The nature of the relationship between image, "imagery" and imagination can be profoundly fluctuating, because fluctuating – and often ambiguous - is the nature of the image, in light of the notes in the previous paragraph, due to the fluctuating nature of the gaze of those who observe and study them. So, as previously stated (Luigini, 2017), there are images that "set in images" their author's imagination (artworks or project drawings) and images that seek to discover their original intentions (cognitive drawing - survey drawing); images deeply rooted in a real space (geographical maps and images of cities) and images that act in a necessarily imagined space (virtual & augmented reality, utopian cities or Piranesi-like spaces); images that intentionally alter perceived reality (photographic manipulations) and images that derive from deception or from the alteration of perceptual patterns (anamorphic representations and disperceptive phenomena); images that build narrative processes (visual storytelling, visual journalism) and educational images, that can shape knowledge, know-how and being (didactic

iconography and iconology); images that enhance the narrative experience of the child (illustration for children) and experiential images that are a synthesis of time and space (children's drawing); images that stimulate the imagination of the observer (visual design) and interactive images that support the imagination of the planner (processing and visualisation of data on a territorial scale). Thus Art, Architecture, Visual Communication, Education, Psychology, as well as the disciplines that derive substantial possibilities for their development from the signification of images, are gathered in this common research space where different methodologies and epistemologies complement one another.

Yet, the conviction shared by much of the scientific community is that the field of study in which many of the approaches introduced so far - and many others - converge is the field of visual studies, in the different ways it is understood in different geographical-cultural areas. First of all because in visual studies the tendency is to focus the analysis on any type of image that is an integral part of a cultural process far beyond the field of art (Elkins, 2001), but also because considering images as cultural artifacts dignifies paying attention to the context in which the images themselves originate, to the original condition in which they were produced, to their original presupposition, to their author's intentions, and to the meanings and contents that have been recognized by those who have placed themselves before those images (Pinotti, Somaini, 2016, p. 38). This approach is broader and can therefore be applied more easily to the various fields of study that require a heteronomous epistemological approach for the study of images.

### 3. GENESIS

Pinotti and Somaini (2016) places the origins of visual culture in the work of critic Béla Balász and artist László Moholy-Nagy, both Hungarians but active in the German-speaking

area: in their reflections, based on the locutions of *visuelle Kultur*, *optische Kultur* and *Schaukultur*, it is possible to trace the description of the paradigm introduced by the use of photographic and cinematographic means, which determined a profound change in the relationship between image and reality. Moreover, the production of moving images using the *machine* that, according to director Jean Epstein, rethinks reality on the basis of its technical possibilities and its own *intelligence*, intervenes on the imagination and on memory (Pasquali, 2002).

But the invention of printing is where Béla Balázs places the start of the process of transformation from what he calls *visible spirit* to *readable spirit* (Pinotti, Somaini, 2016, p. 4), i.e. the transition from image to word that film technique then recaptured in the large-scale production and diffusion of the return to the image in the visual dimension.

With regards to the culture of vision, around the 1920s László Moholy-Nagy introduced the theme of using light to configure the material of objects in space, giving rise to new cultures and new forms of expression; the Hungarian artist trusted in the influence that cinema and photography could have on the cultural transformation of vision associated with human experience. Thus the overlapping of multiple images, curved screens and light projections, would lead to the codification of a form of visual education for individual perceptive patterns as they would be modified by the technological medium.

What light represented for Moholy-Nagy from the artistic point of view in the act of vision, was represented for Jean Epstein by cinema, by the *machine* in action that intervened in the recording of movement and the consequent restitution of dynamic images, profoundly changing the perception of reality in evolution over time. The characteristic of fluidity and variability of the image-space over time, through the cinematographic device, defined a further formal syntax, that of visual emotions; in fact, Epstein referred to visual thought, «a quick, tangible, plastic knowledge that is acquired directly

through the gaze» (Pinotti, Somaini, 2016, p. 11).

Those heroic years witnessed the development of numerous studies on the world of images, giving rise to a shift from a completely art-centric vision to a broader vision that would not mature until much later: in this sense it is also possible to consider the loss of the *aura* enunciated by Benjamin (1936/1966), as an attestation of the inevitability of the process of directing scholars' attention away from the work of art towards images that are not art. A process that would come to completion only half a century later.

#### 4. BILD, BILDER/BILDUNG, EINBILDUNG

If what has just been described is the origin of visual culture as we consider it today, it should be stressed once again that the number of contemporary studies dealing with images is much greater. Pinotti and Somaini also outline a line of development that leads from the studies of Husserl and Fink to the above-mentioned Sartre or Merleau-Ponty, in a variegated range of approaches to phenomenological studies, as well as, later, in the field of hermeneutics, semiotics, psychology and neuroscience, or analytical theories of depiction. This list seems to represent the set of disciplinary fields that, earlier and more thoroughly than others, perhaps, have proposed a systematic reflection on the triad ontology-epistemology-methodology, more structured than in other disciplinary fields. These fields have also made the study of images a non-secondary aim: this is true in the graphic sciences, where graphic designers and architects, among others, are active, but also for pedagogues - as other scholars have amply recounted in other contributions to this volume - or for all those disciplines that in some way, in any way, are interested in what images can tell us (for example the interpretation of what is invisible through the visible in archaeology, philology, cognitive sciences, etc.), the transformation of a concept into an image (think of mathematics, from the colour version

of Euclid published by Byrne to proof-without-words, and physics, whose teaching, for example, is greatly enhanced by a metaphorisation through images) or any other mode of “writing” or “reading” an image.

This inclusive attitude involves many difficulties and some risks.

The main difficulties can be found in the transliteration of concepts and arguments from one discipline to another when they take on different meanings depending on the context - the term “representation” alone is a clear example - sometimes much deeper than simple terminological “nuances”, in the epistemological difference between disciplines that often leads to the formulation of different questions when faced with common problems, or in the lack of inherently interdisciplinary literature. Whereas the risks lie mainly in dispersion and cultural crossbreeding. Dispersion, because the skills required to work within the domain of images are many and of different nature (perceptological, psychological, aesthetic, technical, etc.), while the cultural crossbreeding, which in this case acquires a negative meaning, occurs when one loses control of a solid epistemological and methodological apparatus, necessary to produce scientific research that can be shared with the scientific community.

Yet, the advantages of interdisciplinary research, particularly around the theme of images, seem to be more convincing than the fear of running into the difficulties outlined above: first of all, given the intrinsically inter- and trans-disciplinary nature of the object of study, as mentioned above, it can only be enhanced by the encounter of studies of different kinds, but secondly, the opening of innovative strands of research seems more likely if accompanied by an intense interaction between different points of view.

An example of excellence in the field of interdisciplinary research is the *Bild-Wissen-Gestaltung*, the laboratory of the Humboldt University in Berlin founded by Horst Bredekamp, in the presentation of which we read:

*“Complex problems cannot be solved within the boundaries of*

*a single academic discipline. They require the knowledge and skills of researchers from different fields of knowledge: representatives from more than 40 different disciplines were involved in the research of fundamental design processes in the sciences at the Interdisciplinary Laboratory "Image Knowledge Gestaltung" at Humboldt-Universität zu Berlin from 2012-2018". (Bild-Wissen-Gestaltung, 2019)*

Moreover, it is no accident that many interdisciplinary studies on images arise in the German-speaking area, because as Bredekamp himself explains in one of his successful essays:

*Because the meaning of the German word Bild includes image, picture, figure and illustration, the term Bildwissenschaft has no equivalence in the English language. It seems as if this linguistic difference is deepening an ongoing distinction between English- and German-speaking art history. (Bredekamp, 2003, p.418)*

Similarly to this vertical vision of the term *bild*, it is rather suggestive to note the progressive containment in a horizontal sense, like nested Chinese boxes, of the terms *bild*, *bildung* and *einbildung*, which probably refer to the conceptual succession that from the "figure" - *bild* - passes through "giving shape" - *bildung* - and goes back to "conceiving a new shape/figure" - *einbildung* -. A triad, referring to the context in which these brief notes were developed - the *Fakultät für Bildungswissenschaft der Freie Universität Bozen* - which presents itself as parallel to the triad on which this new journal is founded, which in a process of further investigation will seek to explore the world of images, imagery and the imagination. In German *bild*, *bilder* and *einbildung*.

#### NOTES

1 Interesting in this regard are, among others, the studies conducted by the research centre *Sichtbarkeit und Sichtbarmachung* (Visibility and visualization) of the University of Potsdam, or the IKKM (Internationales Kolleg für Kulturtechnikforschung und Medienphilosophie). For more information, consult the websites: <http://www.sichtbarkeit-sichtbarmachung.de/>, <https://www.ikkm-weimar.de/>.

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# GRAPHIC TRANSCRIPTIONS LE CORBUSIER AND THE BOLOGNA ENIGMA

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## ESSAY 13/01

REDRAWING  
HISTORY  
UNBUILT

The “architectures in the drawer” turn out as real thermometers of the culture of their time. The digital model, continuously swinging in motions of History, Representation and Design, is the catalyst of the representation, the starting point for the construction of new images of possible architectures. The drawing is a knowledge process

that intervenes both on the field of project making and processing, and on that of interpretation and critical analysis of the work. The redrawing of *Église pour Bologne* wants to reconstruct the path that those ‘eyes’ had seen to forment knowledge of an architecture of which remain few graphics clues.

## INTRODUCTION

When we are about to represent the work of Le Corbusier, which has profoundly influenced the history of architecture and whose thought is both complex and, in some ways, enigmatic, we are rightly afraid of both the greatness of the Master and the words written around his vast and articulated work. If precision, according to Gregotti's thought (Gregotti, 1991), is one of the characteristics of critically representing, one can comfort oneself, in an absolutely consolatory way, with the conviction that 'patient representation' is, after all, analogous to Le Corbusier 'patient research' and that a study of a project by the Swiss master through redrawing explores only a small part of that vast territory of his design and theoretical production. Representation is therefore a process of knowledge that intervenes both in the field of training and design elaboration, and in that of interpretation and critical analysis of the work. Representation therefore indicates both a graphic-visual result, *Darstellung*, and a theoretical and conceptual aspect, *Vorstellung*, a hinge between theory and construction (Ugo, 2004).

In the critical analysis of a work, carried out through the drawing, the notion/problem that allows the interface between *Darstellung* and *Vorstellung* is the *mimesis* that is not a trivial reproduction, imitation or copying, but, according to the Aristotelian meaning, a process of improvement, transcriptive and translatory knowledge of an object, composed of form, structure and content.

Mimesis finds in representation a vast field of investigation because, through critical analysis, it selects those elements that define the work in its precise essence.

In 1994 Vittorio Ugo wrote: "The challenge, the main problem of representation, in architecture, consists [...] in this: in being able to account for all its statutes, all its metrical, material and qualitative determinations by means of its simulacrum; to allow the experience and knowledge while it is not present, while it remains in the perceptual distance

or in the virtuality of the project: in (*léthe*), the Greeks would have said; that is, in that oblivion or in that concealment from which (*alétheia*) –truth or unveiling– is extraction.

With some simplification, it can be said that history unveils itself by opposing oblivion or selecting memory, while theory does so by opposing concealment or selecting sense; (*tékhne*), finally, unveils the truth of physical laws by selecting evidence and balance and opposing natural material degradation, but also by elevating the work to the level of *ars*.

In a certain sense, then, like history, theory and technology, representation must also have a truthful function: not only it is not allowed to betray the “truth” of the work, but it must also reveal it to us, demonstrate, and obstruct it, placing itself in relation both to history and to theory and to technology; and its truth must unfold on a double level: with respect to the work, as fidelity of the “copy” produced with respect to an “original” currently absent; and with respect to the representation itself as internal coherence of the re-productive process. In other words, the following question arises: if it is certain that representation is a “double” of reality (existing or planned), what relations it establishes and maintains with this one, what codes can guarantee its veritative character, the analytical and cognitive results, the heuristic value, the integrated participation in the process of knowledge and architectural design?” (Ugo, 1994, pp. 10-11).

## MATERIALS AND METHODS

On the basis of these considerations, the ‘theoretical’ choice of the digital model as a representation in which the elements of the analysis converge is based on the conviction that the construction of the model is not the production of a simple image, an operation often practiced for the representation of the project, but is the hermeneutical and critical outcome of the drawing which tends substantially to the analysis of the form, the real object of imitation.

The digital model is the tool used by architectural critics to investigate an unbuilt project by Le Corbusier; the graphic investigation *in absentia*, moving between the thought and the work of the Swiss architect, tries to trace a coherent path of the design process.

In February 1963 Le Corbusier received a letter from the Cardinal of Bologna, Giacomo Lercaro, in which he was invited to evaluate the possibility of designing a church in the Emilian capital as part of the program '*Nuove chiese di periferia*'; the *Èglise pour Bologne* is one of the most enigmatic projects of the Swiss master, above all because of the limited iconographic documentation existing. Although the project has remained at the stage of aphorism, it has already been investigated and 'restored' in its form by Andrea Bertolini and Marco Prodi, through orthogonal projections, plan-elevations-sections, and with a *maquettes*, representations that allowed Giuliano Gresleri to further describe the intricate Bolognese rebus (Gresleri, Gresleri, Berolini & Prodi, 1998).

The errors and traps that can be made by interpreting the drawings of others, in this case those of Le Corbusier and those of Bertolini and Prodi, are manifold: from *horror ambiguitatis*, to the almost romantic presumption of trying to be contemporary to the author, thus crossing a temporal abyss, to the fear of being arrogant in translating something that has already been translated.

The awareness of providing new keys to interpretation through graphic criticism helps to overcome fears when one is convinced that new interpretations (representations) are useful for the knowledge of a work whose construction has been precluded and that the drawing "is not finished" because, as Gadamer says, understanding "is never just a reproductive act, but also a productive act" (Gadamer, 1983, p. 346).

## RESULTS

The aim of this study is to explore the directions that those eyes had seen and to reconstruct the path from which

they had started in order to increase, through new representations of the project, the knowledge of those unbuilt architectures which have fallen into unjustified oblivion.

“The key is this: ... to look, to observe, to see, to imagine, to invent, to create”. In this memo of August the 15th, in 1963, written a few months after receiving the letter of Cardinal Lercaro, Le Corbusier indicates, in the essentiality of the message, a way to practice the knowledge of architecture, the relationship between thought and things, or the world of objects and facts that surround us and accompany our artistic experience.

In the triad watch-observe-see is the secret of those who do not want to be surprised by the phenomena of reality, which investigated and analyzed becomes the heritage of our knowledge.

Looking implies the education of the senses to the multiplicity and difference of forms; observing captures the reasons for differences by revealing their rules; seeing traces meanings and values.

The second Le Corbusier's triad, imaging-inventing-creating, uses terms that bi-univocally determine not only the production of the work but also clarify a condition of being, its social project and the eccentric position it had with respect to the dominant thought within that revolutionary atmosphere characterizing that mutable period.

Paraphrasing the Le Corbusierian will, in particular the terms of the second triad, and transferring its meanings almost exclusively in the discipline of representation, it seems possible to re-structure the synthetic message of the Master in “the key is this: ... look, observe, see, imagine, represent, draw” in which the second triad uses terms that, in a bi-univocal way, determine not only the representation of the object but clarify a condition of being through the putting into form of the relationship between the I-investigator and the object investigated. How does this putting into shape happen? With the drawing, absolutely.

Imaging, including and excluding, mixes the multiplicity of forms, representing traces the rules of the imagination

and prepares the mind/hand to the 'gestures' of drawing, which manifests new meanings and values; our own.

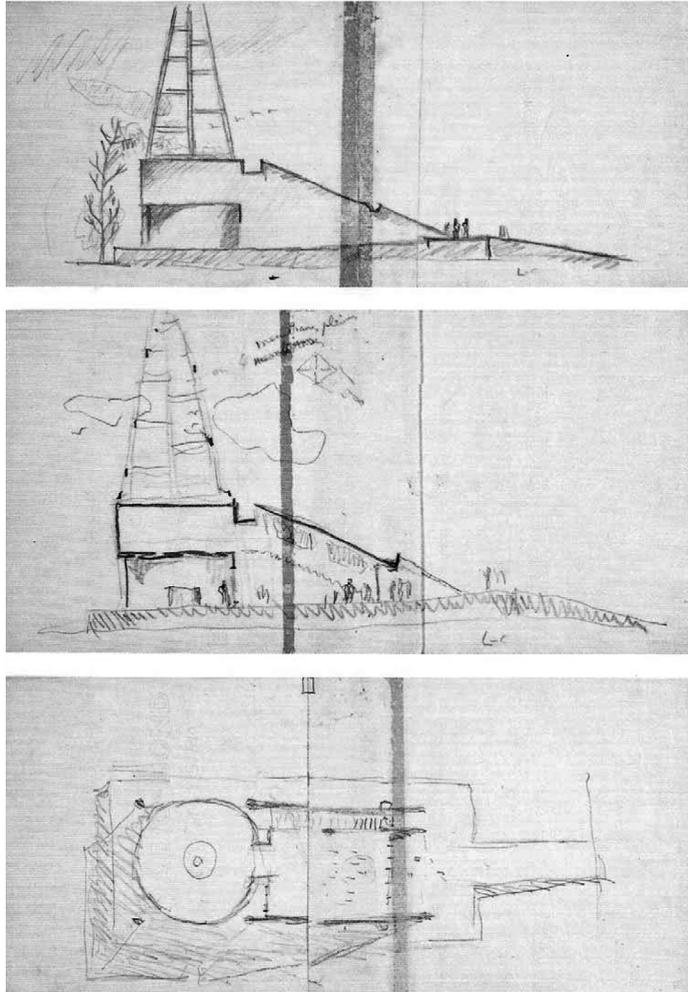
After all, the drawing sheet behaves metaphorically in the same way as the intellect: it stratifies, sediments from techniques to intentions, lets large quantities of materials accumulate, runs through the landscapes of the imagination. There is no drawing without imagination because there is no thought that does not explore its indeterminate boundaries.

Leopardi, in *L'Infinito*, "advances for the first time, in the shipwreck of reason only reasoning, a noesis of imagination, which is not mere illusion. Illusion is a second nature that allows us to overcome the harshness of nature itself. Imagination is what protrudes, on the edge of a hedge, beyond the last horizon and thus allows us to know what is taken away from the 'usual' eyes and minds. In this sense Leopardi can say that if 'imagination becomes attached to illusion' it is not identified with it, and that 'without imagination' life 'is carnage, desert, hell'. Baudelaire will say: a prison" (Rella, 1997, p. 71).

Each drawing contains a mystery, a sign that refers to something whose boundaries cannot be drawn, something that belongs to the subject, an enigma that can only be intuited with the audacity of the reader's imagination.

In 1998 the interpretative drawings of the project of the church for Bologna were published, carried out by Andrea Bertolini and Marco Prodi as part of a design course held by Francesco Venezia at the University Institute of Architecture in Venice; the aim of this course was to make the students work "in the manner of". The interpretative process of this study has as its starting point also the works of Bertolini and Prodi. Reconstructing the lines of LeCorbusier's thought from the three 1:100 scale sketches produced by the Swiss master (Figure 1) is not an easy task because one can easily fall into the error of using quotations relating to other projects of the Master himself that, decontextualized, lose their intrinsic value of univocal solutions.

**Fig. 1** Le Corbusier, Sketches for *l'Église pour Bologne*, 1963.



The sketch is the tool with which the architect fixes the idea and in which he clarifies, first to himself, which are the possible ways from which to trace the path to define the project.

In the project for the church in Bologna, the tools of the Modulor and the skillful orchestration of the volumes are combined with a process that sees the re-emergence of ancient teachings, travel impressions and sketches of his *Carnet*; the trajectory is then traced. A trajectory that refers to elements of sedimentation that the Master uses to respond to theoretical research; the use of these sedimentations is well

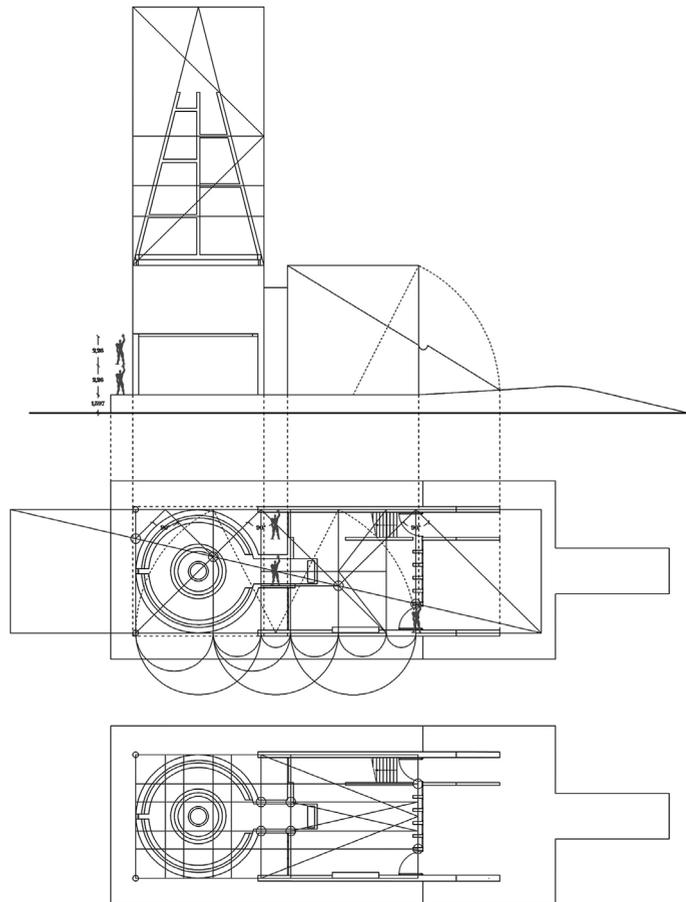
highlighted by Gresleri in the analogy between the plan of the Chiesa Santo Sepolcro and the *Eglise pour Bologne*. A further analysis would have been possible if the *Carnet Voyage d'Italie*, in which there were certainly studies and notes on Bolognese monuments, had not been lost. The interpretative work begins, therefore, with the analysis of a sketch that indicates the possible creative directions with the awareness of moving with caution, knowing that interpretation, however personal, is only a hypothesis. As suggested by the notes in the *Carnet*, Bertolini-Prodi's interpretation finds its geometric rule in the Modulor and in the golden ratios; this study has been accompanied by two other possible interpretations.

The first, always using the layout of the Modulor, traces the main measures of the building, identifying, in the articulation of spaces, the wise use of the Fibonacci series; the second, instead, is based on the harmonic deconstruction of the generating square according to the Hambidge procedure, taken from the book by Matila Ghyka, *The golden number*, which Le Corbusier certainly did not ignore (Figure 2).

The project is composed of the juxtaposition of autonomous but strongly connected bodies. The layout of the double chapel system is developed along a central axis that contains the spaces of the churchyard, the assembly hall and the baptistery; the base gives the building the character of sacredness. The access to the second level constitutes a new lateral axis and is formed by the staircase and the perforated septum that separates it from the lower chapel; the 'autonomous' position of the staircase could be due to a biblical reference, to the Old Testament allegory of Jacob's staircase.

The elevations and the section clearly show the succession of three elements: the circular shape of the baptistery, the square of the upper chapel and the steeple trellis with unfinished spire.

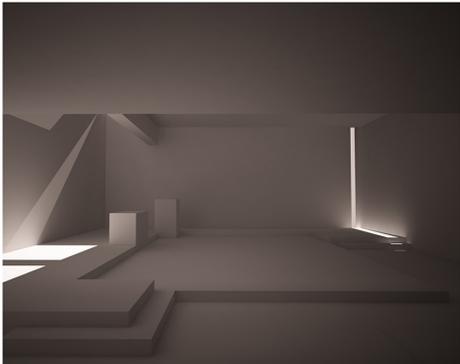
The second level is supported on the base by two pillars that make it independent from the baptistery below; the bodies are separated by a slot that allows a soft illumination of the baptistery. The succession of these elements con-



**Fig. 2** A. Tortorici, Graphical analysis of the plants and of the side elevation of the church for Bologna, 2014.

cluded by the spire has a clear theological meaning in the structure that is lightened upwards, a symbol of the transcendence of God.

This study makes some changes to the Bertolini-Prodi interpretation concerning the lighting of the lower chapel, the access churchyard and the orientation of the upper one. The modifications concerning the lighting of the lower chapel and the access square were 'solicited' by the analysis of the Master's autograph sketches in which there is no continuity between the U-shaped element of the upper chapel



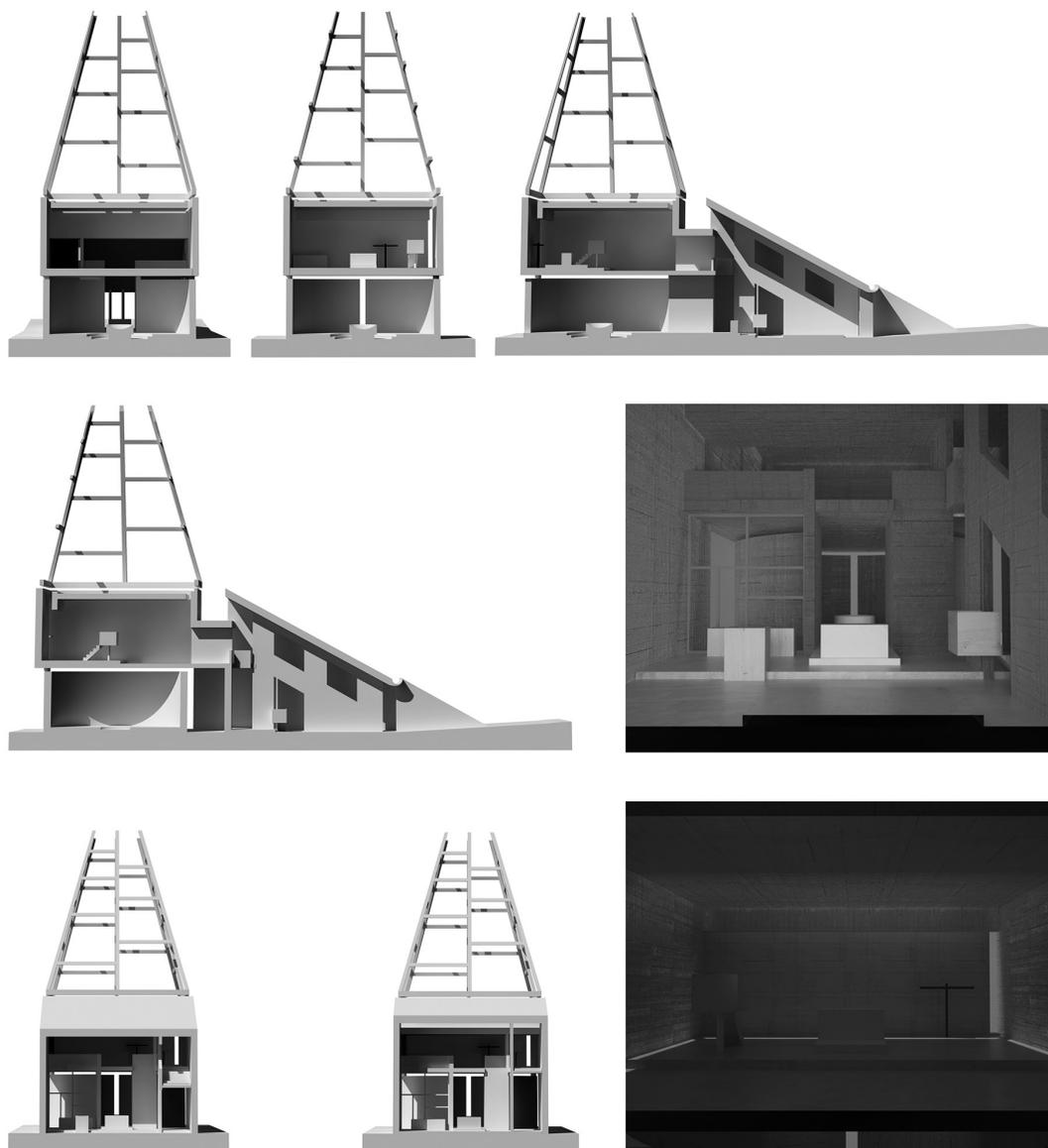
roof and the lower chapel roof, while Bertolini-Prodi, on the other hand, mark only a slender gap between these two elements; the graphic elaboration and the rendering of the two hypotheses show how the first produces light effects that make the environment 'closer' to other sacred spaces created by the Swiss master (Figure 3).

The interpretative variants relating to the upper chapel derive from the study and analysis of the architecture of Le Corbusier's religious buildings, their orientations and the arrangement of their eminentialities; the south–north axis of the Bertolini–Prodi interpretation has been rotated along the east-west axis. Le Corbusier, an authoritative expert on the liturgical program, knew the theological meaning of this orientation: "From west to east it is the path of Christ who enters in the midst of his own people that leads down: by his presence in his ministers, in his assembly, in the symbolic signs of the liturgical rituality - astil cross, Easter candle and others - with the entry procession by ministers entering the assembly together with the symbolic signs of the liturgical rituality, and it is the path of his ministers that leads him towards the procession of communion as communion with the symbolic signs of the liturgical rituality, and it is the path of his ministers that leads him towards the procession of communion as communion. It is a path, east west and vice versa, that refers to the apse and the altar and is architecturally generated by the door; in fact, the door is the truly critical threshold of the rising and setting of light in the hall. From south to north, instead, there is no process, there is stasis" (Valenziano 1997, p. 172).

In the new layout light enters, as in the case of Bertolini-Prodi, from 'cuts' formed between the roof of the chapel and the perimeter walls; the pulpit, an element not used by Le Corbusier, present in the interpretation published in "Parametro", is replaced, in the new interpretation, by an ambo, an element that we find both in the church of Ronchamp and in that of Firminy, from which the word of God is proclaimed. The new interpretation of the space of the

**Fig. 3** A. Tortorici, Study of the natural lighting of the Church compared to the spatial interpretations of Bertolini and Prodi, 2014.

**Fig. 4** A. Tortorici, Sections and renderings of the graphic interpretation of the church project for Bologna, 2014.



baptistery concerns the number of steps necessary to reach the baptismal font; according to the Second Vatican Council these must be three and not two as it appears in the Bertolini-Prodi interpretation (Figure 4).

## CONCLUSIONS

The representation assumes a substantial role in this study because it investigates the project of architecture, the central place of its true expression (Ugo, 2004). Graphic analysis is that part of representation which is closest to the sphere of criticism and which approaches the “extensive aesthetic and philosophical treatises which are presented under the title of *Teorie dell'architettura*” (Fasolo, 1962, p. 3).

Vincenzo Fasolo, at the end of the 1950s, in a collection of his own lectures given at the Faculty of Architecture of the University of Rome, proposing graphic analysis as a method of studying architecture, called for “...a history of architecture...drawn, instead of spoken...”. [and wrote that] the method of study that we propose tends to arouse a self-examination of architectural values in what is permanent in them, common, both for the ancient and for the modern. It is precisely a study of the ancient fact in function of the modern that will acquire greater validity even if in it you pass on the experience and nobility of epochs of builders of high secular civilization. What is now proposed is not at the expense of the modern critical method; on the contrary, it integrates it and arouses its interest. Because this ‘drawing’ is an observation, and therefore a thinking” (Fasolo, 1962, p. 3).

Graphic analyses of the past, in which the ‘expression of light’ of a building was highlighted also through chiaroscuro, can now be carried out with rendering techniques that must, however, always refer to the correct use of the modes of the science of representation.

The graphic operations are not intended to replace the elaborations of criticism, made with the use of verbal lan-

guage, but to bring contributions to the understanding of forms analyzed with the same language -the drawing- that serves to communicate the forms of space. Graphic analysis does not replace verbal criticism, it supports it. Graphic analysis is extraordinarily useful in interpreting projects that have never been carried out and for which, obviously, it is not possible to directly verify their formal and spatial values. The three-dimensional model built in digital drawing is not only a virtual image of the building, it is the only possible image and the only existential reality.

This work seeks to verify whether graphic analysis, today, can still be one of the aspects of the form of criticism and add something new to the written word.

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# THE VISUAL REALISM CONTINUUM

## THE ROLES OF HIGH AND LOW-FIDELITY PICTURES

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## ESSAY 14/01

LOW-FIDELITY PICTURES  
ILLUSTRATION  
IDENTIFICATION  
CATEGORIZATION

The human brain has a tolerance for varied views of objects which allows it to regard new impressions in the eye as objects perhaps previously seen but under different viewing conditions. This tolerance is a function of visual constancies, where the brain knows that the eye is looking at a familiar object but under changed ambient lighting conditions, position or distance, and so on. Lower fidelity pictures, deployed by the image-maker, allow for these more generalized views of objects to be presented to the viewer rather than the decontextualized moment of reality captured in the photograph. Pictures, either representing visual reality faithfully, or reduced in fidelity, away from

their referents, connect to two key aspects of the psychology of seeing: *identification*—where the picture helps the beholder to see the difference between things in the same class (for example, in the class “humans”: discerning Marco from Alessandro); and *categorization*—telling the difference between one class of things and another (for example, “buildings” and “vehicles”: discerning a house from a lorry). Knowledge of these faculties of human vision will help to build an appreciation of the special advantages of communicating with pictures, especially pictures of reduced visual realism, and should be as central to a theory on visual communication as semiotics.

Humans have evolved seeing their surroundings in sharp detail. So, one could be forgiven for assuming that pictures which faithfully reproduce that detail should be the choice for all visual communication. Depending on the visual communication task however, a high-fidelity photograph is often out-performed by pictures of lower fidelity. How is it that we can see and understand pictures that don't look exactly like things look in the world, and what is the significance of this for visual communication?

The human brain has a tolerance for varied views of objects which allows it to regard new impressions in the eye as objects perhaps previously seen but under different viewing conditions. This tolerance is a function of visual constancies, such as shape constancy—where the brain knows that the eye is looking at a familiar object but from an unfamiliar angle— or size constancy—where the brain knows that the eye is looking at a familiar object but from a novel distance— or colour constancy—where the brain knows that the eye is looking at a familiar object but under changed ambient lighting conditions— and so on. Lower fidelity pictures, deployed by the image-maker, allow for these more generalized views of objects to be presented to the viewer rather than the decontextualized moment of reality captured in the photograph. Knowledge of these faculties of human vision will help to build an appreciation of the special advantages of communicating with pictures, especially pictures of reduced visual realism.

Pictures, either representing visual reality faithfully, or reduced in fidelity, away from their referents, connect to two key aspects of the psychology of seeing: identification—where the picture helps the beholder to see the difference between things in the same class (for example, in the class “humans”: discerning Marco from Alessandro); and categorization—telling the difference between one class of things and another (for example, “buildings” and “vehicles”: discerning a house from a lorry).

The first task, identification, is a very fine-grained problem for the human visual system. It requires a level of detail

to overcome the problem of visual homogeneity. People are of relatively similar shapes. Detail interior to their silhouettes—the short contours within the longer contour of a person’s outline—is necessary to enable this discernment. The second task, categorization, is a simpler problem. To be sure of its object-hypothesis, the human visual system needs only the longer contours to discern the difference between two objects from different classes. Hence, the silhouettes typical in pictograms are ample to communicate a general human form, a building or a vehicle.

In graphic design there has always been a separation between words, which are usually supplied by the client, and typography, the inaudible ‘voice’ that the designer gives to the client’s words. A parallel separation (borrowed from W.J.T Mitchell, 2008) can be made between “image” and “picture”. For visual choices designers and illustrators should concern themselves equally with image; with what is shown, as with picture; how that thing is shown.

The visual realism continuum, an imaginary scale upon which pictures of the same image may have their fidelity compared, is a conceptual instrument that makes this distinction more clear. Any image (whether seen in the real world with the eyes, or imagined in the mind) can be captured with varying degrees of fidelity in a picture, with the photograph at the very realistic end of the scale and the chirograph, or hand-made picture supplying all the other possibilities of depiction. The continuum very roughly parallels Peirce’s semiotics of icon, index and symbol but sidesteps their association with linguistics and writing, while also reminding us that a picture’s function is a matter of degree and context.

Furthermore, the continuum is an effective way to demonstrate that pictures have a role to play in deliberate communication, and that some kinds of pictures (of higher fidelity) are better at helping us identify specific examples within a class of objects and others (of lower fidelity) are better at helping us categorise things into classes. An understanding

of the human psychological faculties through which we comprehend pictures of reduced fidelity should be as central to a theory on visual communication as semiotics.

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# IMAGES AND MORE IMAGES

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## ESSAY 15/01

IMAGE OVERLOAD

PHOTOGRAPHY

MEMORY

SOCIAL USE OF IMAGES

Today everything happens through images, and a lot happens through photographic images. These can be used in multiple and contradictory ways: some eminently aesthetic, which retain the purpose of electing the image as an artistic artifact, or mainly cultural, which retain the purpose of documenting a significant aspect of reality, are frequently overridden by purely functional uses, which exploit the image for utilitarian purposes, or simply self-representative uses, which record useless moments of human existence only to legitimize it. This is the natural con-

sequence of an epochal social change: the production of photographic images, once the prerogative of a few, is now within everyone's reach. Image overload is the first and most evident consequence of the democratization of the production of images which, once their lives have ended, tend to be relegated to the entropic oblivion of images stored forever, thus adding to the hypertrophic mass of digital data stored but not used. The recovery of control over this visual hyper-productivity can only pass through the reactivation of our critical capacity.

The image is living its own paradox. Its multiplication is so widespread and pervasive as to lead it to a real panvisibility, but its manifestation is so sterile and essential as to reduce it to the embarrassing absence of communication. In its moment of maximum diffusion, the image encounters an identity crisis, being deprived of its primordial role: visually fixing an elementary piece of memory. Through the image we remember moments of life, which have always acquired a visual form; historically only mental and therefore internal, but later (after the birth of the photograph) mainly external. The etymological *imitaginem* contains the imitative quality of the term image, on the basis of which it establishes a two-way relationship with its own meaning. Thus the image is a copy, which derives its constitutive essence from the real world, and this meaning remains unchanged when it embodies the outcome of a purely mental imaginative activity. In this aspect is inherent a claim to truth that, among all the images, characterizes for us photography, so we are led to believe that everything we see photographed matches an analog in the real world. However, this claim is denied when we are faced with “synthetic” photographic portraits generated by algorithms, which merely recombine real portraits by constructing images of real but non-existent human faces, completely unrelated to a real equivalent (thispersondoesnotexist.com).

Today everything happens through images, and a lot happens through photographic images. These can be used in multiple and contradictory ways: some eminently aesthetic, which retain the purpose of electing the image as an artistic artifact (such as the works made and produced in the professional field), or mainly cultural, which retain the purpose of documenting a significant aspect of reality (such as reportage photography). These uses are frequently overridden by purely functional uses, which exploit the image for utilitarian purposes (e.g. shopping list snapshot-promemory) or simply self-representative uses, which record useless moments of human existence only to legitimize it (e.g. the photo of the

meal). This is the natural consequence of an epochal social change: the production of photographic images, once the prerogative of a few, is now within everyone's reach. Anyone with a smartphone, even the average primary school pupil, is able to take pictures or capture videos and then share them and spontaneously enter the continuous flow of production and consumption that characterizes the society of images. But, filtered through the screen of the smartphone, any scene observed can appear worthy of being photographed, generating a sometimes compulsive phenomenon that leads to storing in the memory of their devices thousands of images, few of which are truly memorable.

Image overload is the first and most evident consequence of the democratization of image production: tens of millions of new images are daily published online, all of them potentially usable by any user. In a short essay of 1955 entitled *La follia del mirino* (later reworked in the novel *L'avventura di un fotografo*) Italo Calvino anticipates a very current critical reflection on this subject: "The step between reality that is photographed because it looks beautiful to us and reality that looks beautiful to us because it has been photographed, is very short". (Calvino 1955). That is, as Susan Sontag later points out, "in teaching us a new visual code, photographs alter and enlarge our notions of what is worth looking at and what we have a right to observe" (Sontag 1978). The smartphone we hold in our hands is transformed for our eyes into a beauty generator, a tool capable of aestheticizing our lives by offering us the opportunity to redeem ourselves, through the photo taken and its sharing, from small and large daily frustrations. The photos we take and post succeed in staging another life, our dreamed life: this represents for us an irresistible impulse, which leads us to seize the opportunity to show ourselves publicly for what we are (not), to select the best of ourselves or, at least, what best represents the role we want to play in society (a sort of avatar of Second Life, built, however, for real images).

The possibility of freely accessing images mediated by devices (from the television screen to the smartphone screen) also feeds a sort of voyeuristic drift: immersing oneself in the everyday life of other people, simulating the life of their lives offers the singular and ephemeral illusion of living one's own life more intensely, progressively taking away moments of reality and replacing them with as many moments of fiction. From the Big Brother to the "teleportation" offered by Periscope (which evokes the succession of identifications narrated in *Being John Malkovich*), the lives experienced virtually replace real life, determining the definitive absorption of the private sphere in the public sphere. We all feel called to exhibit our images in a performative spirit and doing so induces in us a false awareness of the success of our existence. Every user has not only the right, but also the technical possibilities (which seem to apply the legitimacy of the same right) to affirm something through images, but often has nothing to affirm and the shots posted every day on the social profile become only a certification of their presence, an attestation of their will to exist, rather than the expression of an authentic message. From the cartesian "cogito ergo sum" to the "post ergo sum" of the third millennium. Even the rampant tendency to self-representation embodied by the practice of selfie (Pinnotti, Somaini 2016, p. 265) goes up to dangerous paradoxes: some recent studies show how incidental selfie deaths have increased in the past few years (first of all in India and Russia), the result of the increasingly extreme dangerousness of the deeds considered necessary for self-affirmation and therefore worthy of being immortalized and spread.

The fruition of the image, its experience, happens today in many different situations, on which a distracted and superficial modality tends to prevail, caused by the enormous multiplicity of images available. Social networks such as Instagram, Pinterest and Flickr are crowded with photographs that contrast the surviving extraordinariness of authorial products with the rampant, absolute ordinariness of the snapshots taken from the daily lives of millions of users. In

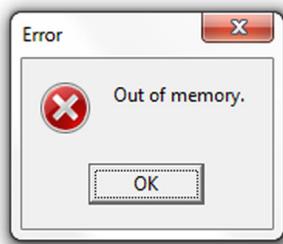
this case too, Calvino's words are enlightening when he stigmatizes the photographer's bulimic attitude, stating that "everything that is not photographed is lost, it is as if it did not exist" and that "to really live you have to photograph as much as you can and to photograph as much as you can you have to live in a way that is as photographable as possible" (Calvino 1955). The possible scenario of the integral replication of every moment of life continues to fascinate man, who in the attempt to store every experience (even the most insignificant) as a visual memory ends up losing the ability to process and select only those moments useful for the maturation and construction of its identity. Among the testimonies of this trend there are two examples that seem to oscillate between opposing positions: the experiment *My-LifeBits* (Microsoft), aimed at building an integral database of individual sensory experiences (a sort of immortal surrogate for human existence), and the warning evoked by the dystopian future narrated in the episode *The Entire History of You* of the British series *Black Mirror*, in which the possibility of endlessly re-projecting the memories of one's own life leads the protagonist to madness.

The life of an image is as pervasive as it is transient and fleeting. The very instant in which the image is taken, it acquires the aura of the past instant; we take it to celebrate the present instant, but immediately after it becomes comparable to other images more dating back in time. The widespread availability and use of digital filters that simulate the aging of the newly fixed shot (glitch effects such as vintage patina or surface wear) also testify to man's desire to regain possession of a reconstructed past: apparently distant, albeit close in time, and equally apparently analogical, albeit obtained by digital means. After sharing, the image actually continues to eternalize its own present, reproducing itself identically endlessly and multiplying the number of experiences that can be made of it.

In this way, the time in which an image remains "active" can be obtained by adding up many distinct moments: the

time necessary for the production of the image, the time necessary for its sharing and the time necessary for its use by all recipients. When an image stops being displayed, it tends to be relegated to the entropic oblivion of images stored forever, thus adding to the hypertrophic mass of digital data stored but not used. Among the possible answers to this accumulating tendency is Snapchat, whose use seems to induce a new awareness in the user, who is now called to produce images destined for definitive oblivion after 24 hours, making a distinction from those that deserve greater attention and that can be chosen as memories. A first step towards the recovery of control over visual hyper-productivity, which can only pass through the reactivation of our critical capacity: it is probably by renouncing to the unstoppable flow that generates images and more images, that we will be able to orient ourselves again towards the authenticity of our social communication.

Fig. 1 Out of memory.



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**FROM VISUAL  
JOURNALISM  
TO INFORMATIVE  
EXPERIENCES**  
OUR RESEARCH  
ON SOCIO DESIGN  
ARTEFACTS IN THE  
INFORMATION FIELD

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## ESSAY 16/01

TRANSFORMATION DESIGN  
INFORMATIVE EXPERIENCES  
SOCIAL DESIGN  
SOCIO DESIGN

This paper introduces the design-research work in the field of information design developed by the author, as a member of the Trans-form research cluster at the Free University of Bozen-Bolzano. The Trans-form group focuses on the interdisciplinary research studies and practices that combine design and the social sciences to promote the concept of sustainability across diverse fields, such as economics, politics, and finally information, with the goal of achieving an inclusive and aware society. Specifically, the way information is produced, consumed, and processed today, online and offline, offers an important space to design interventions and make an impact on society: an aspect to which this paper contributes, presenting the research done by the author in

collaboration with sociologists, anthropologists, and journalists over the past five years at the Trans-form cluster. The following essay introduces the theoretical framework of socio-design within which the Trans-form cluster operates, and then focuses on socio-design in the information field. It subsequently moves on to the research conducted by Trans-form on information socio-artefacts, introducing three of the most significant case studies, which challenged a broader audience with engaging informative experiences aimed at raising awareness to foster possible behavioural change. Finally, the conclusion highlights the research findings over five years and points to new possibilities to design and impact society through socio-design research.

## INTRODUCTION

This paper introduces the design-research work in the field of information design developed by the author, as a member of the Trans-form research cluster at the Free University of Bozen-Bolzano<sup>1</sup>. The Trans-form group focuses on the interdisciplinary research studies and practices that combine design and the social sciences to promote the concept of sustainability across diverse fields, such as economics, politics, and finally information, with the goal of achieving an inclusive and aware society. Specifically, the way information is produced, consumed, and processed today, online and offline, offers an important space to design interventions and make an impact on society: an aspect to which this paper contributes, presenting the research done by the author in collaboration with sociologists, anthropologists, and journalists over the past five years at the Trans-form cluster.

The following essay introduces the theoretical framework of socio-design within which the Trans-form cluster operates, and then focuses on *socio-design* in the information field. It subsequently moves on to the research conducted by Trans-form on information socio-artefacts, introducing three of the most significant case studies, which challenged a broader audience with engaging *informative experiences* aimed at raising awareness to foster possible behavioural change. Finally, the conclusion highlights the research findings over five years and points to new possibilities to design and impact society through socio-design research.

## POLITICAL DESIGN, A THEORETICAL FRAMEWORK

In his book *Adversarial Design*, the designer and researcher Carl di Salvo (2012) sheds light on the differences between the concepts of “Political design” and “Design for democracy”: while the latter refers to “improving the mechanisms of governance and increasing participation in processes of gov-

ernance” (p. 3), the former refers more precisely to those design-forms that embed a socio-political attitude within them, which often serves a function of contestation. In his work, Di Salvo introduces those “artefacts and systems [that] are adversarial because they represent and enact the political conditions of contemporary society and function as contestational objects that challenge and offer alternatives to dominant practices and agendas.” (2012). More than a specific medium, or genre, adversarial objects share a political attitude that allows citizens, participants, readers or users to participate in political expression. The socio-political nature of certain objects resonates strongly in the social sciences, as in the work of sociologist Bruno Latour to whom Di Salvo refers in his book.

Together with the artist/curator Peter Weibel, Bruno Latour framed the concept of object-oriented democracy in 2005 in the exhibition “Making things public” held at the ZKM in Karlsruhe, which asked the question: “What would an object-oriented democracy look like?” (Latour, 2005). The exhibition answers this question by collecting and showing the ways in which artists, designers, social and natural scientists reflect upon and drive reflections on social and political issues through the design of objects, artefacts.

By explicitly defining the object-oriented nature of politics, Latour highlights the role of tangible and intangible artefacts in allowing “matters of concern” to emerge, i.e. issues, or *things*, like “res” in “res publica”, that people discuss and about which they express their concerns, thus contributing to the political –in the wider sense of the word– debate.

Latour, indeed, identifies “matters of fact” and “matters of concern” as the conditions that animate the political and social debate. He writes that our society is built upon continuous negotiations of concerns to establish a *factual* dimension, which is not everlasting; it is on the contrary always subject to re-negotiations that may be prompted by societal, technological or political change. Current democracy results in a tension between the diverse matters of concern, and the diverse positions around them, with the purpose of achiev-

ing a factual condition, a debate often mediated by artefacts.

What Latour then proposes is a shift from politics considered as the primary field for the human exchange of ideas, discourses, and opinions, to a field in which artefacts have the same relevance as ideas and discourses. A field in which artefacts operate as mediators and not as intermediaries (Weibel & Latour, 2005; Mattozzi, 2017). Latour's shift explicitly opens the field of politics to design and legitimizes the work of designers as key to politics and specifically to democracy. This framework resonates in the work of Di Salvo, who reflects upon it from a design perspective. Artefacts such as digital platforms, physical products and tools convey a concern, open a debate, drive reflections, criticize or support the aggregation of people who share the same concern. Artefacts act socially and politically, though they are not officially endowed with a political role, giving voice to a concerned public, and offering an opportunity to take action. Regardless of the chosen medium, these artefacts are mainly characterized by the way they contribute to an issue, by rearticulating the relations in which they take part and by the way they afford a degree of contestation. Within this framework, an apparent new space for design emerges, a space that welcomes contributions, reflections and practices from designers and social scientists.

The theoretical framework in which *Trans-form* operates also draws inspiration from the practical and theoretical work of a series of socially engaged designers and scientists of the past, such as Viktor Papanek (1972), who called for a more sustainable, ethical role of objects at a time when design was largely focused on consumerism and the production of mass products. The *social turn* invoked by Papanek was influenced by left-green-oriented political positions, more akin to the values of social and environmental sustainability, which represented the first call for a radical shift.

Our research approach furthermore built upon the considerations of Lucius Burckhardt on the social impact of design, which led him to coin the term *socio-design*. In his work *Design is invisible*, Burckhardt focused on the social dynamics and

the relations that are triggered when a newly designed intervention or object is introduced into a social context (Burckhardt, 1980). This may originate a series of spontaneous consequences, which are not designed and should be taken into account during the design process. Burckhardt invokes a more conscious form of design, which moves beyond Papanek's paradigm, where objects act as real *social devices* rather than merely embodying social and environmental values.

Though *Trans-form* researchers are more interested in exploring and devising how artefacts contribute to shaping and articulating issues, and not just communicating them, as Otto Neurath was, his experience and that of his team is very relevant for our research. The Austrian philosopher, sociologist and economist designed ISOTYPE, a visual language aimed at informing a broader audience and shaping a more informed and educated society after World War I. He worked with an interdisciplinary group consisting of designers, scientists and experts, with whom he replaced the basic shapes of abstract data visualization (such as bars, lines and circles), with graphic icons that symbolize the topic represented by the visualization, and connect the audience to it (Neurath, & Kinross, 2009). The aim was to raise the cultural conditions of a wider audience that survived WWI, lived in a condition of extreme poverty and needed basic education. Neurath's experience is very relevant to our research because it demonstrates the importance of an interdisciplinary approach to improve the cultural level of a community using visual methods. In support of this, consideration should also be given to the role of the Transformer, which Neurath kept for himself within the working group, and which could mediate the visual and verbal language of the designed artefacts in order to communicate effectively to the target-community.

Given the theoretical framework described above, it now becomes clear how the social role of objects represents an interesting field to which design research may actively contribute, as the *Trans-form* cluster at the Free University of Bozen-Bolzano has been doing for the past several years. Our

approach to information is characterized by an intense collaboration between practitioners, design researchers and social scientists, which allows us to explore the field through a very specific interdisciplinary approach. The long-term goal of our research is to define a series of methodologies to impact society by means of *socio-design artefacts*, with the aim of achieving transformation, and finally to evaluate their impact.

#### SOCIO-DESIGN ARTEFACTS TODAY: A FOCUS ON THE INFORMATION FIELD

The way information is produced, consumed, and processed online and offline today represents an important space for the design of interventions that can impact society.

With the advent of web 2.0 technologies, people who have Internet access have become potential content producers (Deuze, 2001): they are now able to generate and spread content to a broader audience online, with a potentially substantial impact on society through the social networks, for better or for worse. Social movements, such as Occupy, produced and disseminated powerful online narratives that were able to impact and inspire new actions and people. The Arab Spring activist, or the protester at the Turkish Gezi Park riot, were supported by a technological dimension that facilitated their organization in launching collective actions, as well as documenting and publicly denouncing the abuses and injustices they suffered to the international media and the courts (Howard et al., 2011; Khondker, 2011).

At the same time, these objects may have a negative influence and impact on society and democracy, as widely demonstrated by recent phenomena such as online fake-news and the rise of populism, of nationalist movements and parties, strongly supported by online propaganda spread on a massive scale through the social networks.

Given the instrumental nature of technology, in particular of the online social networks, the responsibility that comes

with using and making sense of them becomes evident. The way people produce, retrieve and process information and news is crucial to building their opinions and perceptions. Human factors are, indeed, another essential pillar that should be taken into account during the information process.

Human and technological factors are responsible for the current information ecosystem in which readers and citizens are immersed: a context in which factual information is often overwhelmed by a multitude of narratives that are often more appealing, partial and biased, or sometimes completely misinformed. The readers will be responsible for negotiating their way among the diverse concerned narratives, to build their own position in the debate (Bamberg, 2014). Otherwise, looking at the average behaviour of online readers, they will tend to polarize around the most comfortable narrative, the one that supports and confirms their own position, whether it is reliable or not (Zollo et al., 2017).

What emerges is the importance shared by a scrupulous design process in the development of socio-design interventions within interdisciplinary projects aimed at shaping a more self-aware and inclusive society. Practices and research studies that focus on restoring a more informed debate, on challenging dominant narratives, and on supporting minorities and activists. A framework to which we actively contribute at Trans-form, through the design of socio-design artefacts that connect the social sciences and design, such as the ones we present in this paper. Indeed, the following section introduces our design research on socio-design artefacts by presenting three socio-design case studies that deal with online and offline information.

Relying mainly on visual means, the case studies presented here supported and enabled people to connect with complex and controversial issues, to foster greater awareness: if it is true that we are what we eat, we are also what we read (Johnson, 2015).

## THE SOCIO-OBJECTS DESIGN AT UNIBZ

In 2014 we started a design exploration with our students on the potential offered by information visualization, especially on topics as complex as social issues. From the very beginning, we understood the limits of a mono-disciplinary approach aimed at depicting the complexity embedded in societal issues. We couldn't get far if we had only our design background to rely on. For this reason, we started a collaboration with journalists and social scientists, to portray as many facets as possible of complex social phenomena, to provide multiple entry points on socially controversial issues for a broader audience. The goal is to contrast the over-simplification often carried out by much mainstream media, by providing engaging counter-narratives that enable readers to understand how complex social things are, even when they are represented as simple, on- and offline.

On these bases, we started research on *visual journalism* aiming to extend the existing practice of data-journalism through a visual approach with a strong focus on design. We can date the origin of *data journalism* to the year 1973, thanks to the work of Philip Meyer (2002). His approach combined journalism with statistics, leading to what was known as *computer-assisted reporting* (Powers, 2012), and later to *data journalism*, which relies on the same approach, but makes use of big data and digital tools. Data journalism was an important step in the evolution of journalism, since it impacted not only the methods but the education of journalists as well, who now require statistical, data-science, and data visualization skills.

As designer practitioners and design researchers, we contributed to the practice of data journalism with our skills in information visualization, user experience, interface design and information architecture, giving shape to a more visual information-rich experience which we called visual journalism. It is not a new concept: it originated in the 1970s to describe journalism practices that rely on visual means such as photography or video, and later even comic art and illustra-

tion. At Trans-form, we reshaped the concept, introducing a strong focus on design and a multidisciplinary and collaborative approach, in which the role of the designer is inspired by Neurath's transformer, who can mediate between the diverse roles in the team, and with the target audience as well, through a user-centred approach aimed at adapting the visual and verbal languages to affect the target-community. In light of this framework, we designed several digital artefacts of which the *People's Republic of Bolzano (PRB)* represents the most significant case.

#### THE PEOPLE'S REPUBLIC OF BOLZANO: A DIGITAL SOCIO-DESIGN ARTEFACT

PRB was published online in 2015 with the primary aim of contrasting and debunking the clichés surrounding the local Chinese community of Bozen-Bolzano, often depicted as invaders, and the existence of a Chinatown in the city. The project started with the analysis of quantitative and qualitative data about the local Chinese community of Bozen-Bolzano, which led the team to discover significant facts.

For example more than 200 news articles were published in the previous three years by *Alto Adige*, the most widely-read local newspaper: the majority of the headlines relied on a sensationalistic and often ambiguous language that supported and confirmed the biased perception largely shared by the local citizenship.

Moreover, the quantitative data revealed that Chinese people made up just 0.6% of the city's population, and that only 1.3% of companies were Chinese-run (Moretti et al., 2017). An interdisciplinary team consisting of a journalist, a designer, an anthropologist, a photographer and a computer scientist, made it possible to publish a design inquiry (Di Salvo, 2012), conceived as a visual journalism project that offered a counter-narrative and a different depiction of the local Chinese community, supported by data and facts.

# Restaurants 餐馆



11,8%

Out of 261 local restaurants, only 32 are Chinese, i.e. 11.8% of the total.

Even in terms of restaurants, the figures are far from out of the ordinary and nothing like an invasion: out of 261 local restaurants, just 32 are Chinese, i.e. 11.5%. Compared with other far larger communities, the Chinese run retail businesses meaning they are more visible than, for example, the Romanian and Albanian citizens that work on worksites or farms.

**Fig. 1** Local vs Chinese-run restaurants data visualisation from People's Republic of Bolzano website.

While the quantitative data tells us that there is no invasion in the city, the video interview made by the anthropologist revealed what data can't express: how deeply Chinese people are integrated into the social fabric, what they think about Italy, what their expectations/wants/desires and needs are.

The project positively challenged the public perception of local Chinese people, pushing even the *Alto Adige* to retract its narrative. Moreover, the project served as a knowledge base to support concerned users in their digital debate, giving rise to an unexpected change in the trend of responses on the Facebook page of the *Alto-Adige* newspaper (Felle et al, 2015).

For once, the comments about the project under the article on *Alto Adige's* Facebook page were mainly positive, supporting a more inclusive vision of local society.



**Fig. 2**  
Detail from the TedMed  
17 Participatory Data  
Physicalization at Milan's  
.Politecnico

## KNOW AND BE LIVE: A PARTICIPATORY PHYSICAL SOCIO-DESIGN ARTEFACT

In order to inform a local audience about a largely-avoided topic such as cancer, a research study was commissioned by KnowAndBe.Live<sup>2</sup>, a startup working in the field of cancer prevention awareness, with the aim of fostering a bottom-up information request from a local audience.

The research team included a designer, a sociologist and experts on the topic of cancer-prevention, who worked together relying on a collaborative design approach, with the goal of delineating possible strategies to encourage the search for and retrieval of information on a delicate and largely-avoided topic such as cancer.

The project combined *participatory data physicalization (PDP)*, an information-design approach where the geometry

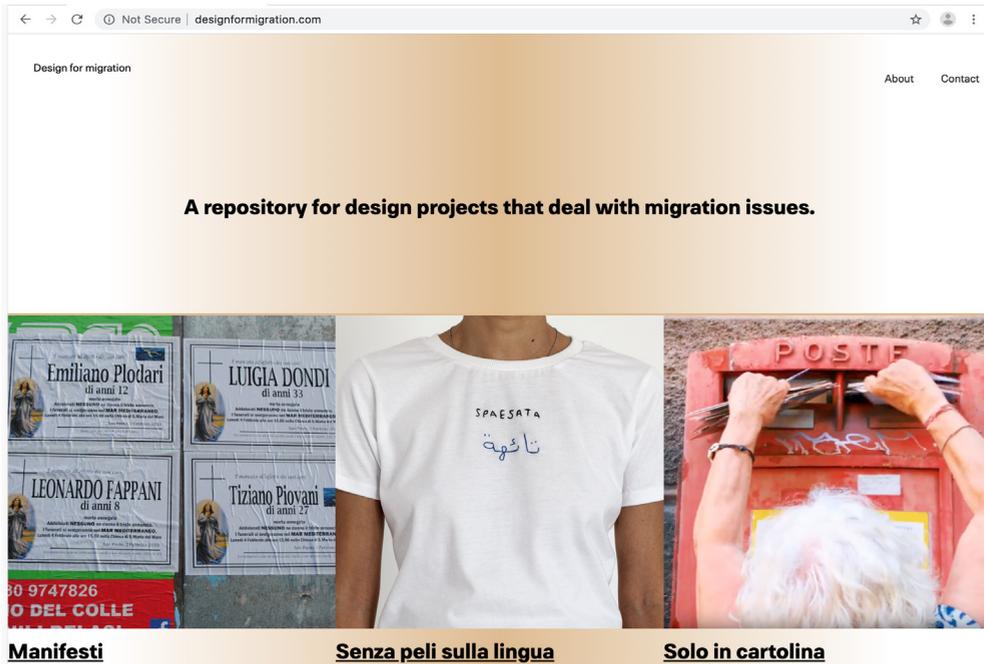


Fig. 3  
Design for migration  
homepage

or material properties of physical artefacts encode data, with a *you-draw-it* approach<sup>3</sup>. This term refers to a series of data journalism projects published by the New York Times, which challenged readers in a guessing game regarding specific data connected to the topic. The act of guessing, indeed, facilitates the assimilation of knowledge by arousing curiosity about the right answer (Golman, & Loewenstein, 2015). Combining these two approaches we designed an experience that involved the local audience of the TedMed 2017 in Milan in confronting the topic of cancer; the experience triggered a bottom-up demand for information which was answered by offering participants a well-designed information booklet.

#### DESIGN FOR MIGRATION: A META SOCIO-DESIGN ARTEFACT

The last case study focuses on the digital platform Design for migration (DFM), an online repository that collects the

most interesting design experiences concerning the Migration phenomenon in Europe, the so-called migrant crisis.

In presenting a wide variety of design artefacts, the platform reveals an innovative approach to promoting a different way to practice design and to deal with social issues. The platform aims to achieve three specific goals:

1. To give these projects (new) visibility, since many of them are very important but little-known, not only by the design public but by the social and political audience as well.

2. To connect designers who share the same concerns on the European territory, with the purpose of building a design network that can facilitate new collaborations, and foster and promote a shared and more inclusive vision of our societies.

3. Inspire and support a broader design, social, municipal, institutional and political audience with new practices and methods which contribute to dismantling the invisible walls that run through our societies, separating us and them.

Thanks to the periodical publication of projects, together with a series of public talks and publications, these goals are slowly being achieved. New collaborations have started among the designers involved, some of the published projects received new attention, funds, and requests for collaboration from municipalities, associations, and young designers who wish to contribute.

## DISCUSSION

- The design approach:

While the three projects differ in terms of medium and purpose, they share a similar design approach which originates in the intense collaboration between designer and social scientist, relying on user-centred and co-design approaches. Indeed, the PRB design process started with a series of interviews and observations in the public space aimed at collecting the most widespread concerns and stereotypes about the Chinese culture and its biased perception, col-

lected by the anthropologist member of the design team. Based on this data, the team co-designed a visual and interactive project that could debunk the most diffused clichés through data and facts. A similar approach was delivered in PDP, where the most widespread misperceptions about cancer and cancer-prevention practices were collected by the design team together with experts and partners, both members of the design team. Next, these beliefs were analysed and used to design an experience aimed at challenging the participants' knowledge. Slightly different is the DFM project, a project by a single author, which therefore lacks the co-design approach, even if it started from a series of considerations, observations and interviews with designers concerned about the migration issue, around which the project is mainly designed.

- The aim:

Moreover, there is a socio-design component embedded in the projects, because they aim to counter-inform an audience on specific issues, and contrast dominant narratives. They enable readers and users to understand the complexity embedded in societal issues, empowering them in the process of negotiation among the diverse narratives, in order to build their own position within the debate (Bamberg, 2014). Indeed, all the projects presented here provide agonistic information: PRB offers a different portrayal of the local Chinese community of Bolzano to foster a less biased perception; PDP first exposes participants to their knowledge-gap and then fills it; and finally, DFM brings to light different narrations on migration which highlight the positivity of a design-oriented approach.

- The impact:

Concerning the impact of these projects, the evaluation of PRB revealed that it activated and served as a knowledge-base to foster participation online. Unexpectedly, the majority of comments and likes began to support a positive posi-

tion towards the Chinese inhabitants of Bolzano, contrasting the biased narration spread by the local media. PRB engaged a series of users to take part in the digital debate on Alto Adige's Facebook page, supporting them to argue positively in favour of the Chinese community in Bolzano. Differently, the PDP project activated the participants: they asked for accurate information about the data on cancer-prevention, once exposed to their knowledge-gap by the interactive installation. The experience we designed triggered a bottom-up quest for information leading to a more aware lifestyle. Differently, DFM achieved some of the goals it set: within a year of its publication, the first collaborations between the different designers published on the website have started. Moreover, as their interviews revealed, the website brought them renewed attention, and many were contacted by the media and especially by institutions. Finally, a series of young designers contacted the platform to confirm their willingness to collaborate on projects concerned with migration.

## CONCLUSIONS

The research we undertook five years ago with the Trans-form cluster at the Free University of Bozen-Bolzano explored diverse methods and practices in the field of information at the intersection of design and the social sciences. They rely on the design of artefacts that can inform a broader audience with serious and accurate information, by providing immersive and engaging digital and physical experiences aimed at supporting the opening of a debate, at leading reflections, providing multiple entry points on complex topics, and contrasting misinformation through the design of counter-narratives. This design attitude may be likened to the socio-design framework conceived by Papanek (1980), and currently referenced in diverse forms by the work of Latour (2015) and Di Salvo (2012).

Relying on this framework, this paper looks back upon

five years of design practice and research in the field of information socio-design. We started within the framework of Visual Journalism (PRB), with the aim of extending and empowering traditional practices of information production with new methodologies and design practices.

We then moved forward to the design of informative-experiences: highly immersive and engaging design artefacts that aim to have people experience what the information is conveying. Information and experience are usually distinct: while information is indirect, because it is always referred by somebody or something, experience is direct, we engage in it first-hand. By the term *informative-experiences* we refer to those artefacts that shorten the distance between them.

Relying on this frame, our research then moved toward more hybrid practices such as participatory data physicalization (PDP), and toward the exploration of innovative ways to inform and provide better information retainment, aiming to activate users with the purpose of fostering behavioural change. Finally, in order to scope new practices and foster networks among European researchers and practitioners, we began to research socio-design practices and research studies on issues of migration, published on a public digital platform which serves as a knowledge base for further studies and research (DFM).

What emerges from the project discussion, is the ample potential offered by the hybrid framework of socio-design, which spans design and the social sciences, informing the practice with more reflexive and exploratory methods that enable a deeper understanding of user and audience needs, as well as a more complex design process generated by the collaborative efforts between interdisciplinary team members. Finally, it appears that a socio-design approach transcends the traditional design disciplines such as product, graphic or interaction design, toward a more issue-based design where the specific medium depends on the issue and the goals that need to be achieved. To conclude, socio-design represents not only an interesting space for design but most

importantly a new space in which design and the social sciences may engage and interact.

## NOTES

- 1 <https://www.unibz.it/en/faculties/design-art/research/transform/>
- 2 <https://www.knowandbe.live/>
- 3 <https://www.nytimes.com/interactive/2017/01/15/us/politics/you-draw-obama-legacy.html>

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**A PICTURE IS WORTH  
A THOUSAND WORDS**  
VISUAL THINKING  
BETWEEN CREATIVE  
THINKING AND  
CRITICAL THINKING  
IN THE TEACHING-  
LEARNING PROCESSES

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## ESSAY 17/01

VISUAL THINKING  
TEACHING  
LEARNING  
MEDIA EDUCATION  
IMAGES

Although contemporary society has a predominantly visual character, education still privileges the written word over all other forms of communication and subordinates the visual text to that written in understanding. In fact, teachers are not always well prepared to analyze the visual language and to discuss its meanings, while working on precise goals and curricular contents, relying mainly on verbal and printed language. Indeed, effective

communication extends beyond the ability to use verbal language to include communication through visual arts and expressive movement, which highlights the value assumed by the use of visual thinking in the use of media and technologies to convey messages and the importance of understanding how to judge their effectiveness, as well as assess their impact.

## 1. VISUAL THINKING AND MULTIMODALITY TEXTS

How can visual thinking be relevant in the training of teachers in all disciplines? Although contemporary society has a predominantly visual character, education still privileges the written word over all other forms of communication and subordinates the visual text to that written in understanding. Children, teens and adults today interact with thousands of moving and fixed images as they navigate their school and extracurricular lives.

All these visual experiences take advantage of the strengths of the various communication and semiotic systems by helping to create learning environments in which language skills do not define the limits of cognition (Eisner, 2002, p. 12). So much so that particular benefits can derive from the use of different and multiple approaches (Barwise & Etchemendy, 1992; Schnotz, 2001; 2002; Mayer, 1997) to particular problems (Ainsworth et al., 2002), in since a multi-representative system can contain representations of different computational properties (eg heterogeneous systems, multimodal systems, multidimensional systems) and can affect students' objectives, decisions and strategies by influencing their use of representation (Schnotz & Bannert, 2003).

Multiple representations can offer unique advantages when people learn complex ideas (Ainsworth, 2006). The complexity of the relations between the various meanings or semiotic systems in a text increases proportionally to the number of ways and methods technically involved to make it happen. The different multimodal modes are creatively integrated in various ways to give rise to configurations to consistently convey the required meaning, shifting the emphasis back and forth between the various modes (Cope & Kalantzis, 2009, p. 423). For example, a text from a film is a complex multimodal text that dynamically combines the semiotic systems of the moving image, audio, spoken language, written language, space and gesture to convey meanings. However, teachers are not always well prepared





to analyze the visual language and to discuss its meanings, while working on precise goals and curricular contents, relying mainly on verbal and printed language; which suggests that they need in their professional development (Britsch, 2013; Cloonan, 2011) to permeate this dimension with visual ability, not in a cumulative sense, since such skills are considered important both to support verbal abilities ones and to address new forms languages that the knowledge society requires to be acquired.

Indeed, effective communication extends beyond the ability to use verbal language to include communication through visual arts and expressive movement, which highlights the value assumed

by the use of visual thinking in the use of media and technologies to convey messages and the importance of understanding how to judge their effectiveness, as well as assess their impact.

Multimedia research has now shown how visual information helps to increase understanding of textual information (Mayer, 2009, p. 223) and that people learn better from images rather than from only words, that is, words and images enhancing each other. Texts and images constitute different symbol systems with specific characteristics; the former are characterized as descriptive symbolic representations, while the latter as iconic representational representations, which makes both of them situated in different types of context, for different kinds of information, complementing each other.





The research results also indicate that the relationship between the visual and verbal areas of students' creative thinking is statistically significant and that the structure of their creative thinking is at the beginning of holistic puberty and has a flexible character with respect to the relationship between visual areas and verbal. They suggest that visual and verbal materials can be used as stimuli through specific techniques, including narrative ones, for the effective development of students' creative thinking. But there remains the problem of how the visual can succeed in encouraging learning of any kind and creativity and under what conditions. The development of creative thinking begins in the early years of life (Butler, Gott, & Quinsenberry, 1975) and starts with imagination, which leads to expressive forms and other creative activities (Piaget & Inhelder, 1966) and to the existence of "front images" that come into play in the provisional graphic of the child before he actually draws.



The transformation of the mental image into a physical picture is observed between the ages of 3 and 6 (Piaget & Inhelder, 1966), when the mental image is transposed into a graphic copy, which can be the representation of the thing as an idea used by the individual to express himself. Indeed, for Piaget and Inhelder (1966), the pictorial representation of movements is possible only when the mental image is supported by the operations of thought, that is, not before 7 or 8 years.

They consider that pictorial representations are static, that they are incapable of figuring the movement. They are centered on states and not on transformations which connect the states to each other. It is only at 7-8 years of age that the mobility of the child's thinking allows him to mentally represent actions on symbolic objects, because the operational thinking is the framework in which the transformations or movements can be represented. In this theory which sees in action the origin of imagined thought, Piaget and Inhelder (1956; 1966) observed that the construction of a mental image can resemble the construction of a pictorial image. But



in reality, imagination, as the basis of all creative activity, is an important component of all aspects of cultural life, allowing artistic, scientific and technical creation alike. In this sense, everything that surrounds us was created by the hand of man, from the whole world of the human. Therefore, for example, the order to perform transformations to mentally construct a practice solution (geometric, pictorial etc.) may reflect the order in which they are you need different types of information about an object to efficiently plan and execute a drawing of that object.

It is in this direction that Torrance (1979a; 1979b; Torrance, Ball, & Safter, 1992) emphasized that imagination is continuous and relates to the explanation of the development of creative thinking, where visual skills play an application and interpretation role for the development of potential visual messages. He (1966, p. 6) defined creativity as a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on, identifying the difficulty, searching for solutions, making guesses, or formulating hypotheses about the deficiencies, testing and retesting these hypotheses and possibly modifying and retesting them, and finally communicating the results. The great potential of creative thinking, for this scholar, originates from visual experience and from the possession of precise skills that he operationalized (1966; 1975).

## 2. VISUAL THINKING, CREATIVE THINKING AND CRITICAL THINKING: WHAT RELATIONSHIP IN TEACHING-LEARNING PROCESSES?

Visual thinking is generally considered as a style of thinking that involves all domains and all visual disciplines, presenting itself as complementary to critical thinking and to creative thinking and to other types of thinking, visual and non-visual. It implies the ability to manage visual information, which has also evolved in response to the emergence

of new media, presupposing new forms of internalization of visuo-manipulative, immersive and movement activities in the environment. Visual thinking involves, for example, the locomotion imagined in imaginary settings, the imagined manipulation of imagined and real objects, but also not present, etc. However, it can be stated that, in addition to strengthening teachers' communication skills, it generates critical thinking skills, including creativity.

The intersection between creativity and critical thinking is the heart of visual thinking. Where creativity involves the ability to explore patterns, shapes, textures and colours through visual means, critical thinking involves examining clues, considering alternatives while exploring different possibilities.

Creative thinking and critical thinking are closely related to the visual dimension as they are related to the capacity for initiative, problem solving, risk assessment, decision-making and constructive project management skills.

These are all skills that play an important role in alphabetic processes and are related to each other. The fundamental competences related to language, reading, writing and calculation and information and communication technologies are cornerstones for learning, where the visual represents the fulcrum for their functioning and where higher order skills supervise the ability to learn to learn as a useful tool for all learning tasks and teaching activities.

However, visual thinking is often poorly understood in curricular behaviors and it is important to find ways to know more deeply its nature and the role it plays within training at all levels, also with reference to creative and critical thinking.

The latter involves continuous discernment through the development of meaningful processes; and it is in this that it becomes an ally of creative thought, which is typically described as an admirable quality or as an unexpected and original way of "finding" solutions or "happening" in situations rather than a fundamental human ability to create meanings.

Thus, too often, the critical-creative form of students' questions ends up being hindered and even denied, if there is no room for its understanding.

In this sense, visual thinking takes on the function of mediation, implementing a powerful synergy between critical and creative thinking and producing powerful learning capable of supporting the understanding of messages and the processes of deep reading of texts. The credibility of the visual message thus becomes central in the training of teachers to develop the sense of visual logic in teaching, which can be called a vital skill to critically evaluate the real meaning of the visual message, which requires students to “decode” carefully the text to be able to make logical inferences and adopt specific visual evidences during the “reading” of the images. Consequently, a profound visual reading involves the adoption of precise abilities that remain at the center of understanding and enjoying complex messages and visual works. The research so far has consistently described the reading of complex visual texts even when the processes differ (Boyles, 2012; Brown & Kappes, 2012; Fisher & Frey, 2012; 2013; 2014; Hinchman & Moore, 2013).



Visual abilities, relating to the creative and critical ones, while based on different constructs for differentiating the outcome of human behaviour, show how people should face everyday problems using all three. Therefore, visual skills, useful tools for the development of creativity and critical thinking skills, are profitably inserted in a teaching-learning context based on problem solving in a didactic design perspective capable of integrating visual, audio and gestural aspects, the spatial and tactile meanings within multimodal and non-limited texts of printed and verbal language, indeed using them finely as a metalanguage for teachers and students to be used for discussion.

The main aspect of this interpretation is therefore not to teach reading and writing images but to use them critically and creatively to solve problems (Rhodes, 1961; Runco, 2014a; 2014b; Schiou, 2014).

Creativity involves communication and self-expression and can express itself using a variety of methods (language, visual and movement) to convey meaning and adapt effectively to a variety of circumstances. In this the reading and writing of, with and through images configure itself as qualified capacities (Segal, Chipman, & Glaser, 1985) and as scientific and technological alphabetic tools (Lawless & Brown, 2015) indispensable in education. It follows that these skills should be reflected in teacher and student training programs to implement even the weakest cognitive skills.

In the learning process it is possible to state that individuals have to face many real-life problems and the main objective of image literacy can only be to guide them to become expert users, users and producers of visual texts. Often the meaning of thinking with and through images is not considered an objective neither of teaching nor of learning, and this implies that the questions to be answered that require the use of this kind of thought are very difficult to fulfill. In today's society, increasing students' ability to solve problems using visual and creative thinking is not considered a goal of education, unlike what happens with the critical one (Paul & Elder, 2008; 2009; 2012a; 2012b). Visual learning is directly associated with critical thinking and indirectly with verbal thinking and communication and can even sometimes be considered a result of the latter. Thus, this kind of thinking serves, in some cases, as a compensatory tool for knowledge, abilities, processes and attitudes (Lai, 2011).

Creative thinking can be defined as a series of cognitive activities used by individuals based on a specific object, specific problem and condition or as a type of effort towards a particular event, fact or problem based on specific abilities, that induces individuals to try to use their imagination, intelligence, intuition and their ideas when they face situations of different kinds.

This suggests the use of an authentic and new design, capable of generating new different design hypotheses that lead to solving problems with the discovery of new applica-

tions and solutions (Young & Balli, 2014) in which each individual is able to recognize the its cognitive limits and is activated to fill these gaps while obtaining new visual points of view.

There are few empirical studies that have explored the reading and use of multimodal or visual (Dalton, 2013) or disciplinary texts (Fang & Pace, 2013) and the relationships they have with the development of visual thinking. As the multi-sign texts with a high information level continue to evolve, the research contributions become increasingly important for development of the literacy, disciplinary and interdisciplinary, as well as to support multimodal reading and writing by students and teachers. For this reason the acquisition of a visual thought becomes an analytical commitment for the comprehension of complex texts and whose close reading requires repeated readings in which the students not only use it but give proof of its use.

It is in this sense that pictures and visual thinking can provide teachers with access to strategic resources, helping to make the students reach even complex goals, and exploiting students' visual knowledge to increase their understanding of reality. If this is true it is necessary that teachers support the kind of skills connected to them and those methodological skills that help them to use them to the fullest. It is a question here of supporting an interpretative approach centered on the active participation of the student, creator of knowledge, who, starting from his personal and social background, is able to construct a visual thought closely linked to observation skills, to the analytical reading of the visual text (Yenawine, 2013) and to reality. This may include the use of heuristic and creative strategies to adequately use different cultural resources such as museums, for example, and to increase the forms of aesthetic knowledge designed to encourage an internalized understanding (Nuzzaci, 2012b).

Research has shown the positive impact that the construction of visual thinking has on learning both in young people and adults. Studies have revealed that, being quite

flexible, it is effective for improving writing (Franco & Unrath, 2014; Moeller et al., 2013), critical thinking (Landorf, 2006a; Moeller et al., 2013, Yenawine & Miller, 2014), encouraging risk-taking (Franco & Unrath, 2014; Landorf, 2006b), supporting acquisitions in a wide range of disciplines and facilitating relations between different content areas (Hailey, 2014) because it supports strategic thinking and the possibilities of thinking in various ways (Yenawine & Miller, 2014, p. 3). Despite this growing body of research, however, it would be necessary to broaden the empirical studies related to the effects that the construction of a visual thought in teachers determines on the quality of teaching.

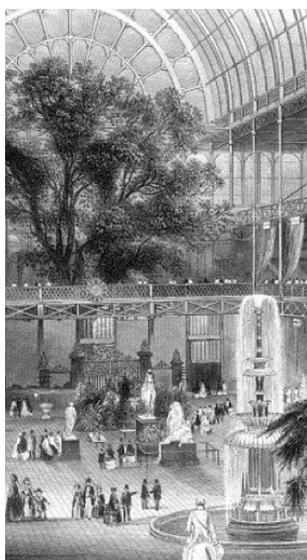
There is little research on how teachers use the visual in disciplinary literacy and multiliteracies processes at all levels of education (Nuzzaci, 2012a), how they perceive the advantages and disadvantages of using images for a careful reading of informational texts at Within specific disciplinary areas, how they employ and analyse a wide range of print texts and not printed in old media forms and new. Little or nothing is known about how the visual experience supports the curricular objectives of basic skills. Images, as decisive didactic supports, facilitating understanding when working with increasingly complex text requests and asking for inferences about visual and non-visual texts, but they are not considered simple outfits. The visual tools also involve critical thinking, which serves to reason effectively both inductively and deductively, to use systems to analyse the interactions of parts as a whole, to make decisions that include the examination of evidence, the analysis by several points of view, to synthesize and make connections between information, drawing conclusions and critically reflecting on experiences, solving problems by examining problems in familiar and innovative ways by developing meaningful questions to find better solutions.

Critical thinking and visual thinking combine in linking materials, previously learned personal experiences and new experiences. In fact, it includes various activities of a multi-

faceted nature (Lawson, 2006). In fact, different disciplines or visual programs implement visual thinking in a variety of forms (Meinel & Leifer, 2010). Variations of visual thinking styles have been reported in many empirical studies (Akin, 2001; Purcell & Gero, 1996), explaining how the visual thinking helps organize thoughts and improve the ability to think and communicate, as a good way of thinking visually, for example, uses the spatial relationship between objects on the page to store information.

Ability to think visually around revolves the awareness of teaching how levels of meaning interact. In its multiple forms (from technical or cartographic representation, to photography or video, to design or illustration, to the fine arts) it can lead to teaching tacit and “felt” knowledge, creative experiences and links from analysis to synthesis (Archer et al., 2005; Cross, 2008; Owen, 2006). Some visual thinking skills are increasingly fundamental and basic in media education and are becoming more important as the use of digital images increases.

### 3. VISUAL THINKING AND MEDIA EDUCATION



The research has estimated that the time spent by students in front of the screen in recent years has doubled (Wartella et al., 2013; Lauricella et al., 2015), confirming how the transition from the printed text to the multimodal one, which combines words, images and sounds, requires a different approach to training by teachers and students (Nuzzaci, 2011; 2012a). While it is true that students' exposure to different media sources does not imply that they know how to critically examine all the images presented to them, it is equally true that it is up to teachers to support students in this burdensome task.

Visual texts should be exploited in schools to support a range of literacy goals and be an integral part of teaching strategies and the communication process in education. In



this sense, the visual training of teachers appears to be decisive in order to be able to ensure that the school is able to seize the opportunities that multi-perspective and multi-view and multimodal texts offer to teaching-learning processes and to make them become real chances in the practice of alphabets.

Visual thinking becomes a powerful cognitive tool in school (Rieber, 1995). In everyday school life, solving problems and spatial reasoning is essential as it allows people to use concrete means to deal with abstract images. However, the world of teaching has fluctuated variously between periods when visualization was considered important in pedagogy or was seen as an obstacle. The pictorial and visual forms of representation can offer advantages over textual resources by offering opportunities to show spatial interrelations, demonstrate proportional relationships within and between objects and facilitate perceptual inference. Furthermore, visualization has achieved tremendous success in helping teachers understand and present their teaching. Indeed, it has been observed that visual forms of representation are important, not only as heuristics and pedagogical tools, but as legitimate aspects of reasoning and learning. Technologies can offer visual experiences favoring higher order cognition as critical thinking and reflective thinking. Students should be encouraged to use multiple modes of representation when learning with ICT.



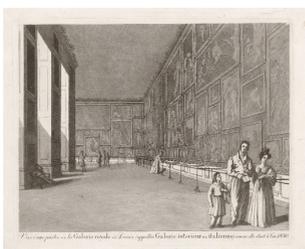
Recognizing the fact that these visual and media tools are changing learning and teaching design behaviors, influencing education processes, many studies have paid attention to the impact of new media on visual thinking and vice versa. For example, the idea of coordinating computer-aided design and drawing up design plans to facilitate the application of new processes, strategies and techniques. Many studies have paid attention to the impact of digital media on visual thinking, which has been implemented in many programs and curricula with the aim of educating to the visual (Meinel & Leifer, 2010; Oxman, 1999), in order to use focused meth-

odologies on man, supporting abductive thinking (Dorst, 2006; 2010; Lockwood, 2010) and taking a multidisciplinary attitude (Meinel & Leifer, 2010) towards knowledge etc. The new media feed visual thinking by making multilingual competences interact with images, developing invisible messages of deeper meaning, encouraging flexibility and increasing the memorization and recovery of mental and real images, reusing existing ones to communicate effectively.

Indispensable for understanding and effectively utilizing the full potential of critical thinking, such skills can be taught using any media. In particular, digital images can be manipulated and test our traditional sense of visual reality; they are stored as discrete fragments of contextless and available information for flexible manipulation, cloning or combining images in new interlocutory relationships. The term visualization is familiar to us from the common use and basically means “to form and manipulate a mental image”. This is a “technically assisted alteration”, which has therefore made visual literacy and the digital potential for image modification more problematic from the point of view of the alteration of external reality. With digital images, what you do visually is immediately editable.

The human motivation for producing pictures that attracts attention and forces effective communication has always been a necessity present in teacher education. At school, with graphic design in any media, digital or otherwise, a difficulty arises in being both the observer and the active creator of the thing observed. In the digital age the teacher has anyway the advantage of increasing a teaching in which it is necessary to make design decisions.

Only by participating deeply in an interactive process and accepting it completely, the teacher creates new combinations of existing educational ideas with a deeper series of meanings. As long as an experience is truly meaningful, students will have to be able to interact with new digital media not as “passive consumers”; and to do so, quality education will be required to develop visual thinking skills necessary to



manage typical aspects of the new digital environment and to adopt a multidisciplinary attitude (Meinel & Leifer, 2010).

Several studies have shown that media education pathways can have a strong influence on how to shape students' thinking styles and their preferred visual strategies. The multiple media forms (from technical or cartographic representation, to photography or video, to design or illustration, to fine arts) can bring tacit and "felt" knowledge and creative experiences and links from analysis to synthesis (Archer et al., 2005; Cross, 2008a; Owen, 2006). Durling et al. (1996) indicated a certain type intuitive way of reasoning, and Lawson (2006) instead explicitly argued that such preferences, in terms of cognitive strategies, are learned behaviours. It is in this sense that it becomes interesting to evaluate the impacts of different visual disciplines on students' visual, creative and critical thinking models, as well as the implications on multimodal and multidisciplinary approaches to learning. Does the promotion of visual thinking create a common and favourable ground for interdisciplinary visual collaborations? Can the variety of curricula focused on visual thinking give shape to different visual interpretations?



In this sense, the visual thinking can be said to be linked to abductive reasoning, that is, the reasoning with which explanatory hypotheses are formed and evaluated. However, adequate formalization should take into account the fact that the explanation is not deduction and that hypotheses sometimes stratify and can be revolutionary; and abductive reasoning can be visual and non-sentenced. Understanding how visual aspects affect hypothesis formation can help to understand the question of visual inference and that of connection with the evaluation of explanatory hypotheses, which can be effectively taught through spatial thought and analysis with the use of technology, as in the case of visualization of maps and images, and can lead to a creative resolution of doubt and to the development of a new and personally significant understanding. The visual abilities thus include various activities of a multifaceted nature (Lawson, 2006),



different disciplines and programs linked to the variety of forms of visual thinking (Meinel & Leifer, 2010). Mediality and variations of thinking styles have been treated in many empirical studies (Akin, 2001; Purcell & Gero, 1996). However, how these disciplinary variations of visual thinking can influence visual experiences of different origins is, in any case, little explored area.

A positive way of “thinking visually” thus becomes a positive way of “medially thinking”, while also leveraging the spatial relationship between virtual and object objects to preserve information. The ability to think visually therefore revolves around the awareness of being able to make all the levels of meaning and the sign systems interact. This also supports the creative process, which is also represented by a special form of reasoning called abductive reasoning, which in turn can lead to a creative resolution of the doubt and to the development of a new and personally significant understanding. So if we thought of school as a place where doubts must be able to flourish and creative processes in students can be encouraged, then the cultivation of visual thought would only point out in all its strength the tangible value of the expression “a picture is worth a thousand words”.

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# VISUAL LANGUAGES AND CULTURE OF THE EDUCATIONAL PROFESSIONS

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## ESSAY 18/01

EDUCATIONAL PROFESSIONAL SKILL  
VISUAL LANGUAGE  
NARRATIVE  
TRAINING

An ample literature recognises how images can significantly impact learning processes. Indeed, the visual recalls the possibility to stimulate and activate foreknowledge suited to the learning objects and to develop the capacity to problematise the contents proposed with reference to complex contexts. Thus, in the educational contexts, the image and, gen-

erally speaking, visual art represent excellent instruments of transmission, communication and deepening of knowledge, contributing to the definition of a cultural model of professional skills, with particular reference to the educational figures like pedagogists, teachers and educators who operate in social and culture contexts.

With reference to the area of study “Art and Education,” this short paper will specifically analyse how images and the patrimonies of a visual nature can contribute to the formation of professional educational figures, such as pedagogists, teachers and educators who operate in social and cultural contexts. Indeed, it is recognised how an experience of a visual nature can fill a strategic educational role, above all in educational terms. Thus, the image and more in general the visual art in the spaces of training can be considered as instruments par excellence for the transmission, communication and deepening of knowledge, contributing to the definition of a cultural models of professional skills (Panciroli 2016; Caldin, Dainese, Panciroli 2017). The contexts of training are thus transformed from spaces of predefined knowledge to laboratories for the acquisition and transformation of knowledge. These changes are also based on the presupposition that knowledge cannot be transmitted but must activate processes of cognitive and emotive reconstruction in the subjects. The subject is no longer understood as an acritical consumer of knowledge but as a constructor and interpreter of knowledge and, in this sense, the images can vehicle such processes. Indeed, the training experience realised by means of the use of the visual languages have highlighted the transition from a decoded reading of meanings already present and definite to interpretive meaning-creating processes, based on the aggregation of several meanings. It thus becomes fundamental to be able to manipulate objects to construct new personal and professional meanings (Raiyn, 2016; Panciroli 2019). Hence, the image becomes metaphor in that it allows for the re-elaboration of meanings in an original way and in close connection with the professional context of provenance.

Specifically with regard to the processes of acquisition and cognitive re-elaboration, the visual recalls the possibility to stimulate and activate foreknowledge suited to the objects of learning and to develop the capacity to problematise the contents proposed with reference to complex contexts. In a multimedia and multimodal perspective

even digital technology has multiplied and promoted new approaches oriented to visual thinking, on the grounds of which learning becomes more meaningful when ideas, words and concepts are associated to images (Kress 2009; Calvani 2011; Landriscina 2012; Lumbelli 2012; Serafini 2014; Lacelle, Boutin, Lebrun 2017; Panciroli, Corazza, Macauda 2019). In that sense, the images represent a motivating mediator, particularly effective for stimulating and improving learning. With reference to the theory of multiple intelligences (Gardner, 1983), visual intelligence indeed defines the cognitive abilities linked to the imagination and to the capacity to “think by images,” that is to mentally picture the concepts, even before verbalising them, allowing one to make an immediate experience of the world (Robertson 2003; Grandin 2006; Cicalò 2016; Fiorentino 2018). The production/use of an image promotes motivation allowing one to activate learning and explorative processes, those of categorisation, memory, prediction, comprehension, as well as empathy. In this regard also Clark and Lyons (2010) identify among the functions of the images those regarding attention, the activation of knowledge, the minimisation of the cognitive load and support for motivation. Hence, if the images can exert the function of anticipation and modelling vis-à-vis knowledge (Rivoltella 2012), the processes of acquisition and re-elaboration of the knowledge are tied not only to the vision of the images of the world but also to the representation of the world by images. The image is thus understood both as product that presupposes an activity of reading, understanding, interpretation and re-elaboration of meanings, and as process with reference to the construction and diffusion of new semantic contents. Within the scope of a self-regulated and motivating learning model (Hattie, & Timperley, 2007), via the images the students generate and use images actively, constructing new meaning networks (Rivoltella, Rossi 2019). Hence, in a meaningful learning process there have to be interconnected visual intelligences and knowledge-building.

The training experiments carried out in the years 2014-2015 at the Department of Education Sciences of the University of Bologna until the present have been addressed to the design of pathways via visual patrimonies for the development of abilities and competencies aimed at the enhancement of educational professional profiles. Specifically, the profiles involved were teachers, social and cultural educators, pedagogists. The model which the following educational experiments have referred to, i.e. "Learning about school heritage," "At school with the heritage" and "Art and inclusion," embraces two fundamental approaches: that of narration and that of the knowledge-building.

As regards the narrative approach, the training has used as the privileged channel of mediation the setting up of images, traced back to a number of expressive forms (photography, cartoon, street art, cinema,...), defining the educational process in which the educators have been involved, narrating new aspects that have been enriched with new meanings. Indeed, within this visual corpus, attention has been focused on images that, albeit spatially and temporally distant, provided a reading that time by time is new and semantically dense. Instead, in relation to the constructivist approach, the trainee educators have been able to define and re-elaborate concepts in which the bond between creativity and experience has become particularly relevant. In this sense, creativity has been structured as a form of graphic-visual and emotional intelligence that has gradually been adapted to experience, manifesting itself through the realisation of artefacts. The visual artefact (Rossi, 2010; 2019) has indeed allowed the student to converse with the world and with knowledge allowing him/her to build bridges between the different levels of knowledge itself, between formal and informal contexts, between real and digital spaces, between spaces of experience and those of knowledge, between spaces for reflection and those for training.

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# OBJECT BASED LEARNING IN MUSEUM EDUCATION

HOW TO IMAGINE  
A NEW INCLUSIVE  
HERITAGE

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## ESSAY 19/01

MUSEUM EDUCATION  
OBJECT-BASED LEARNING  
HANDS-ON  
INCLUSION  
HERITAGE EDUCATION

The use of effective methodologies in terms of knowledge acquisition and transverse competences promotion is one of the most successful solutions for the promotion of social and cultural inclusion within museums and heritage fruition contexts. Object-based learning is one of the most effective methodologies in terms of users' engagement and transverse skills promotion, such as critical thinking, communication, collaboration, promoting participants' social inclusion and well-being. Users who come

into direct contact with museum objects decrease their levels of irritability, nervousness and sadness by becoming more interested in the museum environment, participating actively and enthusiastically in the activities of object manipulation. Since several years, the Centre of Museum Studies, based at University of Roma Tre, conducts educational research based on the use of Object-based learning within museum contexts to support knowledge acquisition and skills development at different educational levels.

For several years, the Centre of Museum Studies, based at University of Roma Tre, has been engaged in the design and realization of educational paths within museum contexts aimed at promoting the inclusion of all social categories through artistic and cultural institutions operating in a specific territory.

Museums always have a very strong connection with the territory in which they are situated. The knowledge that can be acquired through museums, even from an artistic and cultural perspective, is strongly connected with the visitors' knowledge about the territory they live in and its history. Thanks to the study and understanding of the phenomena characterising the environment surrounding them, visitors come into contact with the culture of the territory itself, thus increasing their understanding and acquiring skills useful to actively participate in social life. The lack of a valid educational contribution on the matter is the reason of the limited culture of the territory among our population and, consequently, of the wrong perception of the value of the environment, the society and the culture as a whole.

Furthermore, more in detail, certain members of the society seldom take part in the social, culture, artistic life of the territory they live in. As a result, they cannot contribute to the building and sharing of the collective memory of the region and, more in general, of the country they live in. The superfluous knowledge of the territory in which such groups of people live, depending on the lack of participation in the social life and the exclusion from the places in which culture is promoted, such as museums, leads to their worrying exclusion from active citizenship, with dire consequences such as social exclusion and, sometimes, social tensions.

The use of effective methodologies in terms of knowledge acquisition and transversal competences promotion is one of the most successful solutions for the promotion of social and cultural inclusion. Over the last two decades, mainly in the Anglo-Saxon world, *Object Based Learning* (OBL) –learning through objects– has been known and used as an important learning resource for everybody who learns, from primary school pupils to adults (Durbin et al., 1990; Wiley, 2000; Par-

is, 2002; Lane and Wallace, 2007). OBL is a didactic method based on the direct contact with the object itself and its interpretation through the use of all five senses. This methodology is a form of active learning (Freeman et al., 2014) based on a socio-constructivist approach, which uses objects to promote deeper levels of learning (Romanek & Lynch, 2008). The OBL main aim is to achieve global knowledge of the object and be able to give an interpretation. Objects offer, in fact, a tactile experience that stimulates learners to question themselves about it and to conceptualize their own thinking.

Moreover, using objects in the classroom or in learning pathways can stimulate activities in all curricular areas, students are actively engaged in the subject they are studying and such engagement can be achieved by arranging learning

**Fig. 1** Handling activity at Museo Nazionale Etrusco di Villa Giulia, Rome.



activities for the students, rather than making them listen passively. Object-handling has a long-lasting effect and relationship with memory, more so than text-based learning often has (Romanek & Lynch 2008, 224). For these reasons, OBL has been introduced in the field of museum didactics: learning activities based on the study of museum artifacts can enrich and deepen learning through specific knowledge acquisition and skills development. In the UK, the use of OBL in the field of museum didactics has become an integral part within University curricula at the UCL (Chatterjee & Hannan, 2015): “Despite a strong tradition of using lectures as a way of delivering the curriculum, the positive benefits of ‘active’ and ‘experiential learning’ are being recognised in Universities at both a strategic level and in daily teaching practice. As mu-

seum artefacts, specimens and art works are used to evoke, provoke, and challenge students' engagement with their subject, so transformational learning can take place".

Furthermore, the latest research in the field highlights how the use of the OBL within museum supports the promotion of the visitors' well-being (Desmarais, Bedford, & Chatterjee, 2018). Users who come into direct contact with museum objects, especially those with mental and/or mental disabilities or senile dementia, decrease their levels of irritability, nervousness and sadness by becoming more interested in the museum environment, participating actively and enthusiastically in the activities of object manipulation. Handling activities and OBL group sessions support collaboration and communication between participants, creating a positive and stimulating learning environment and supporting inclusion at cultural and social level.

**Fig. 2** Activities of description and drawing of the museum object using the OBL methodology. Museo Nazionale Etrusco di Villa Giulia, Rome.



In light of this, OBL proves to be an effective didactic method for the development of visitors' wellbeing and social inclusion. Imagining, designing and carrying out OBL activities in museum contexts and providing guidelines for OBL activities to museum operators, also through digital tools, are necessary actions in the context of inclusive cultural heritage fruition.

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**THE DIGITAL IMAGE  
AS COMPLEX  
ENVIRONMENTAL  
INTERFACE**  
A SCENARIO  
ADDITIONAL READING

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## ESSAY 20/01

DIGITAL IMAGE

INTERFACE

ENVIRONMENTAL INFOSPHERE

The digital society has transformed our cognitive, social, productive and aesthetic experience of the world. Many deep and continuous changes, still in progress and harbingers of the next adjustments, will occur due to the imminent evolution of digital technologies into environmental holistic infosphere, where it seems to delineate the integration between virtual and physical.

The focus is on some changes of the Rep-

resentation's scientific discipline and interrogations on the future scenarios: the following reflections deal with the impact of digital on architecture and representation and how much the mediascape has influenced the current digital processes of production, reproduction and distribution of images modifying our perception and experience of space, time, material, senses and identity.

## INTRODUCTION. THE ISSUE OF THE STUDY

The current characterization of the digital society and infoculture is based on the large and easy co-production of ideas and contents and has transformed our cognitive, social, productive and aesthetic experience of the world. Many deep and continuous changes, still in progress and harbingers of the next adjustments will occur due the imminent evolution of digital technologies from infosphere on devices to digital technologies on environmental infosphere, a holistic habitat where the *media convergence*<sup>1</sup> seems to delineate the integration of the virtual and the physical.

Abundant literature, no longer recent but significant for its predictivity (Negroponte, 1995; Levy, 1997; Buffardi & de Kerckhove, 2011; Maldonado, 2015), prefigured at the beginning and today deals with the subject of the deep cultural impact of mediascape on the processes and expressions of our interest, referring to how the current digital processes of production, reproduction and distribution of information and images influence our perception and experience of space, time, material, senses and identity<sup>2</sup> (Packer & Jordan, 2001; Lichty, 2013; de Kerckhove & de Almeida, 2014; Campanelli, 2016; Bostenaru Dan & Craciun, 2016). These reflections refer to this and to the specialist literature on the impact of digital on architecture and representation (Sacchi, & Unali 2003; Balzani, 2017; Sacchi, 2018), focusing on some main changes of the Representation's scientific discipline and interrogations on the scenarios in front of us.

## DISCUSSION. DIGITAL DRAWING AND SURVEY: THREE COORDINATE CHANGES

The trajectories along which the changes in the status of the Drawing and survey discipline have mainly taken place in recent years<sup>3</sup> can be briefly traced back to a series of transformations, which in turn may perhaps be summarized in

three main configuration changes of which we propose here a large scale synopsis, preparatory to subsequent hypotheses in final conclusion.

- *from point to cloud*: the two main terms that have always constituted the disciplinary topics of Drawing - survey and representation - have recently become less precise but more complex than in the past, becoming almost a semantic cloud full of intersections and contaminations<sup>4</sup> (similar to point-cloud, which shows the artifact's objective description and at the same time its multiple representations). It has emerged we could define a methodological cloud, constituted at least by the nodes *Survey, representation, drawing, visual, infographic, data visualization*, which has always been linked to the application cloud constituted by the finalization of the *project, the documentation, the enhancement, the education, the communication*. And between the two, the deep system transformation operated and mediated by an environmental context cloud: a digital ecosystem dotted with the virtual, the IOT, the big data, the AI.

- *from vector to spatial trajectory*: the well-established irruption of digital world seems, moreover, to have meant not only the introduction of a new third intermediate presence between the pre-existing methodological and application fields but also a change in the structure of mutual relations: if first among the individual terms from the methodological and from the application field there were two-way relationships, in which each point directly connects to another in a direct one-to-one relationship, the digital ecosystem modifies the relationship vectors in a multidimensional aggregative cluster that transforms the linear work tracks (survey applied to valorisation, representation applied to education, visual applied to communication and so on) in trajectories on metaphorically mesh-like surfaces, measurable and dynamically interpretable according to the given topological approximation.

- *from the triad to the scientific hybridization*: if the scientific triad that has characterized the discipline of Drawing in the analog era was based on the three epistemological elements

of method, tools and techniques, then digital seems to have induced on this model also transformations of convergence and hybridization between the three logical categories with an outcome of greater choice of outputs and flexibility of the consequent applicative impacts: it seems difficult, for example, to put the use of photomodeling by SFM exclusively in the methodology, omitting the overlap with the technique due to the automation of the entire images processing workflow.

#### RESULTS. SCENARIO CONFIGURATIONS

As widely seen for the theoretical and physical production of architecture, even in representation the digital paradigm seems to have functioned therefore as a catalyst that has profoundly transformed not only instrumentation but role, meaning and outcome of our discipline allowing to keep it closely linked to evolution of knowledge, society and professionalism.

Consequently, the field of work and the instrumental and conceptual materials on our table (and desktops) have continually been updated constantly changing in nature and prefiguring again today a different set that will soon invade in our daily life and work with IOT, AI and robotics.

In this framework of continuous transitions, by its multiple material and immaterial meanings till now the image has been an element of continuity and has maintained its centrality representing the fulcrum of every change of domain (Quici, 2018).

#### CONCLUSIONS. FROM THE IMAGE TO THE INTERFACE

Some characteristics of the information society and of the new media society described by Lichty (2013) coexist synergistically today, confirming again to the sight the gno-seological predominance already consolidated in history,

even if in a situation of progressive shift of paradigm towards holistic and multisensory approaches to the acquisition and representation of knowledge, an ongoing shift that prefigures a further adjustment of terms and concepts related to the role of images in the knowledge society.

The predominance of the sight established in Western culture in the Renaissance<sup>5</sup> is today called into question by the contemporary digital culture that despite is expressly based on visual languages, moves towards the holistic re-composition of the knowledge<sup>6</sup>, in particular through the interactivity of augmented tactility as a technological extension of touch but also through the virtuality as proprioceptive expansion of all the senses<sup>7</sup>.

In this sense, the sight is still at the center of knowledge and keeping of the real world, but the image will continue to transform in an interface to overcome the interval between the body and things and the perspective viewer's eye<sup>8</sup> will abandon its fixed position and immersively be placing itself into an articulated and complex system of information architectures.

The development of this theme in the coming years will tell us in what terms also in the net condition can be confirmed the lesson of Wöllflin and Panofsky –according to which the forms of vision identify the culture of each epoch and each society adopts the representation of the space that most correspond to its vision of the world– and if this shift from the image to the interface, it can also be considered symptomatic and paradigmatic of our condition of increasing complexity.

## NOTES

**1** “*Media convergence*”: phenomenon involving the interconnection of information and communications technologies, computer networks, and media content. It brings together the “three C’s” –computing, communication, and content– and is a direct consequence of the digitization of media content and the popularization of the Internet. *Media convergence* transforms established industries, services, and work practices and enables entirely new forms of content to emerge. It erodes long-established media industry and content “silos” and increasingly uncouples content from particular devices, which in turn presents major challenges for public policy and regulation (Flew, T. (2017).

**2** Leaving aside here the whole interesting topic of thought in socio-cultural practices (Campanelli, 2010) not in the focus of discussion, one cannot to mention the fundamental contribution to these studies given in the decades by the media and communication theorists of the Toronto school, today above all focused on the themes of the relationship between technology and social experience of space and time, with the attention on how technologies intertwine with each other and together shape the architectural and urban environment by altering its rhythm, time and life.

**3** The proceedings of the last three editions of the International Conference of the Professors in Representation disciplines are cited as a significant view of the progress of the discipline: Firenze 2016: Bertocci & Bini, 2016. Napoli 2017: Di Luggo, Giordano, Florio, Papa, Rossi, Zerlenga, Barba, Campi, Cirafici, 2017. Milano 2018: Salerno, 2018. Perugia 2019: Belardi, 2019.

**4** Even in the digital world remains valid and become strong the identification, already emerged in the strong orientation towards visual representations of post-modern, of contamination as a powerful agent of cultural transformation: each category is even today more and more subject to a hybridization where a sphere can replacing another by expanding, with a process that has also deeply affected architecture and its representation (Baudrillard, 1993).

**5** The predominance of sight in Western culture comes from antiquity but assumes almost characters of hegemony from the Renaissance, when it refers to the passage from the oral story to the printed story, that is from the oral culture acquired through the hearing and in community to the individual one acquired by mental and silent reading; Baudrillard, 1987; Parigi, 2004; Campanelli, 2016.

**6** de Kerckhove & de Almeida (2014) point out in particular how the interval between subject and reality caused by the dominance of vision is being overcome, which isolates only one sense compared to the others: “An embodied sensation of the world and a re-sensorialization of the environment are described to visually biased perspective with a renewed sense of relationship to spatial and material surrounds. What is attempted to induce the topological reunion of sensation and cognition, of sense and sen-

sibility and of the body, self and world” (p. 2). And in the same sense Vercellone (2017) seems to go when says that the: “Image also tends more and more to constitute a culture that assumes the features of the embodiment, in which that is, the symbols tend to assume sensitive forms and even to be incorporated, to overcome the surface of representation for express oneself on a synaesthetic level”.

7 “While the point of view is still central to the Western mental ecology, there are signs that other ways of apprehending the world involving more senses are evolving albeit in a paradoxical fashion. As it extends the nervous system, electricity expands the reaches of all the senses. The Internet, the Web and the electronic grid of the planet provide humans with an extension of their central nervous systems, linking body to the environment and vice-versa” (de Kerckhove & de Almeida, 2014, p. 3).

8 We then directly refer to the importance of perspective and the geometrical perspective viewer’s eye also as a symbolic and cultural synonym; from the extensive bibliography on the topic we cite only a text still today fundamental: Panofsky, 1984.

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# TOWARDS THE USE OF IMAGES ON THE WEB

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## ESSAY 21/01

IMAGES

WEB

KNOWLEDGE

INVESTIGATION

It could be the task of a new scientific magazine dealing with images to question themselves about the studies that can be done on the heritage of images on the web, rather than aiming only to create new ones. Behind the methods of selection and production of images there are informations that can interest both the psychologist and the anthropologist, both the visual culture scholar and the architect. What considerations can we draw from the hyper-produc-

tion of contemporary images? What use can be made of photographs, illustrations, graphics, drawings collected on the web that go beyond the immediate aesthetic enjoyment and superficial reception of the messages they carry with them? The high degree of problematic that this kind of investigations suggests reveals a particular wealth of themes for those who wish to investigate image-mediated knowledge available on the Web.

Our alleged network of knowledge seems today to be structured not on the paper heritage but on the digital one, not so much on the text as on the images. We constantly live in an overload of informations that is difficult to manage and we think that images make them more understandable and immediate to be grasped and examined. On the other hand, Fichte himself recognized that “knowledge starts from image or representation” (Vercellone, 2017, p.19).

Keeping up with the statistics of the various *image-sharing* or *photo storage* websites is practically impossible, given the constant acceleration of the phenomenon of production and image sharing. It is estimated that every two minutes in the United States alone are shot more photographs than in the entire nineteenth century. But to professional and amateur photographs we need to add the images produced by scientists, artists, architects, graphic designers, viewers and 3D artists, drawings, infographics and graphic notations, x-rays, cartographies, illustrations, and so on, not to mention moving images. To the new images produced we must then add the historical images that flow back into the Net following the digitization of the library and archival heritage, images that belong to analogical production practices of the past, today cultivated by a few virtuous ones.

A version of that Encyclopedic Palace by Marino Auriti, borrowed by Massimiliano Gioni to give the title in 2013 to one of the best editions of the Venice International Art Exhibition, seems to be recognized on the Net. The imaginary museum conceived by Auriti and patented by him in 1955 as an ideal container of all the humanity’s knowledge—an ideal shared with all those who, over time, have tried to “build an image of the world”—seems to recognize itself in the stratified accumulation of images shared in the Net.

Since there is not a single maker to structure the knowledge or the taxonomic organization of materials, in the Net the images cannot be recalled in an order that can be defined oriented, immediately and univocally recognizable, because

they always emerge organized by analogical associations, according to parameters indexing that do not refer only to their contents and their characteristics.

So if Gioni's exhibition proposed to develop an investigation into the ways in which images are used by artists "to organize knowledge and to shape our experience of the world" (Gioni, 2013), it comes to mind if it would not be appropriate to think more to how to study the heritage of images already present and available on the Web, rather than indiscriminately producing new ones. This is one of the possible challenges that a scientific magazine dedicated to images can take to make a contribution to one's time.

From a quick search on the Web it is possible to see how the Network itself provides numerous and up-to-date instructions and information on how to search for images, how to download them or withdraw them (possibly without payment), on copyright issues and how to circumvent them, on how to make other people's images their own, in essence, how to make websites, social profiles and blogs more captivating through images able to capture the attention and burn instantly. Little or nothing can be learned from search engines about what can be learned from the images of the Web, about how they should be interpreted beyond marketing strategies, what "image-world" can be deduced from them.

In the field of architecture, for example, we begin to pay particular attention to photographs taken and shared by ordinary people in the planned places, to better understand the use made of them. We can probably trace back to 2006, the first monographic publication of an international architectural firm –the Dutch studio OMA (Office for Metropolitan Architecture)–, in which the projects are not presented through the shots of professional photographers, officially commissioned by the design studio, but through a sampling of photos published on the Web. The intent, made explicit in the premise of the publication, is that of not wanting to put the qualities of buildings at the center, but rather to monitor their effects by users and visitors (AMO/Rem Koolhaas, 2006).

Along the same lines, a few years later, in setting the editorial line of a new monograph (Ruby I. & A., 2013), the MVRDV architecture and urbanism practice will be looking in the Web for new shots of its projects, taken by amateur photographers, to tell what is noticed about their buildings and their spaces by common passers-by, users and visitors.

Photographs and videos shared on social media and on *photo-storage* sites are effectively changing the way, not only to look at architecture and the city, but also to modify the same design parameters giving more and more weight, for example, to the *storytelling* artifice. Dana Behrman, Senior Urban Designer by UNStudio (United Network Studio), recently stated: “We look at social media, at images that people post”, because from the pictures it’s possible to see “how do they actually appropriate the spaces, that are often times different from what we image to be”. “The more a building is capable of engaging somehow the visitors beyond the program that it is meant to solve, at least from a certain point of view, the more it is successful today” added Giacomo Ardesio by AMO/OMA (PLAN-SITE, 2019).

The social aspect of architecture is therefore something that is constantly reinvented by the society that appropriates it, and we witness it through a heterogeneous production of images. horizons. The photographs of architectures and urban spaces on the Web, for example, provide informations on which different skills can actually work and compare, in a way that goes beyond the disciplinary barriers on which the “scientifically ordered” knowledge was built. After all, as pointed out by David Weinberger: “Networked knowledge is less certain but more human. Less settled but more transparent. Less reliable but more inclusive. Less consistent but far richer” (Weinberger, 2012, p. XV).

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# UNSEEN IMAGES

## IMAGINATION THROUGH THE ALTERATION OF DESIGN PROCESSES

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## ESSAY 22/01

IMAGINATION  
COLLAGE  
DESIGN PROCESS  
CREATIVITY  
SEEING AS

This paper begins with a brief summary of a variety of theories on the creative process, addressing the question how unseen, surprising and intriguing images come about. A close reading of the collage process employed by the artist Sabine Hertig is conducted, following the claim by Gille Deleuze, that

the artist is emptying out the canvas instead of filling it up (Deleuze, 2003). The analysis of her process to create small and large-scale collages, taking 'scraps' from old magazines, shows how her specific methodology alters and combines preconceived processes so that they lead to unexpected results.

'If I knew where my ideas come from, I'd go there' was the title of Thomas Demand's lecture at a 2010 conference on the subject of imagination at the Schaulager in Basel (Demand, 2010). The artist, who creates paper models starting from well-known press images and then documents these as photographs, had been invited so that attendees could discover how his pictures came about and how his creative process had developed. At first, Demand's presentation title sounds as if it were casually thrown out. But it indicates that we cannot solve the puzzle of how fascinating and surprising images are generated with a simple formula. Nonetheless the goal of creating surprise remains a key concern, both in the making of images in an art context and in the applied field of visual communication (Lyotrad, 1997). How does it come to pass that images are created which differ from the familiar, from conventional expectations?

In search of an answer to these questions we encounter the notion that an individual talent is responsible, or that an individual is predisposed to being imaginative and is also thus able to create unseen images. In these sources imagination is described – depending on the individual's relationship to religion, their autonomous constitution or their social environment – as the result of divine inspiration (Assmann, 2003), as a predisposition to imaginative genius (Kant, 1790) or as a consequence of social interaction. Whether there can be anything new at all is contradicted by the viewpoint that everything we perceive as new has only been forgotten and is waiting to be rediscovered (Plato, 380BC).

What is less radical is to imagine that the new can be achieved just by combining known elements. With this a spectrum opens up between imagination, the power to create something genuinely new, and figuration, meaning the principle of combining familiar elements (Mersch, 2006). Different creative processes can be placed on this spectrum. At first glance, thus, drawing and painting are processes that enable images to appear from an empty space and are therefore apportioned to the imagination. As the arrangement of

existing pictorial elements, collage is a process of generating images linked with the principle of figuration which starts from an existing pool of image elements and their combination. The differentiation of these creative processes is, however, questionable, if we include Gilles Deleuze's conception of the painting process in our survey: 'It is a mistake to think that the painter works on a white surface. The figurative belief follows from this mistake. If the painter were before a white surface, he – or she – could reproduce on it an external object functioning as a model. But such is not the case. The painter has many things in his head, or around him, or in his studio. Now everything in his head or around him is already in the canvas, more or less virtually, more or less actually, before he begins his work. They are all present in the canvas as so many images, actual or virtual, so that the painter does not have to cover a blank surface, but rather would have to empty it out, clear it, clean it.' (Deleuze, 2003)

This statement relating to painting can be applied, broadly speaking, to other creative processes such as drawing or collage. In these too there is a direct relation between the images saved in the artist's memory and the material image appearing on a surface. A definitive image is carved out from the mass of possible image variations and is, according to Deleuze, more directly dependent on the artist's mental images than on a relation to an actual object. If we now turn to the concrete example of Sabine Hertig's collages, the emptying out of the artist's existing image archive at the moment of the image's genesis can be the starting point of our observation.

#### THE FORMAL COMPOSITION OF THE IMAGE ELEMENTS AND 'SEEING AS'

In contrast to the emptying out of the image surface in the process of drawing or painting, using her collage method Sabine Hertig falls back on a cultural archive that is, materially, at hand. The artist calls the collections of images and image

clippings from various sources piled up in her studio her painting palette. The palette's picture clippings reflect not only the artist's approach to emptying the image surface of existing mental images; they are also the results of the photographers' image finding processes, as well as those of the editors of the magazines and books used. Before Sabine Hertig's involvement they had discharged image surfaces and made one definitive picture visible, while other possible images were not photographed, could not subsequently be printed and cannot now be used in a collage. In this web of influences on Sabine Hertig's work even the reader who, by buying a magazine, influenced its general direction might be ascribed a role in the definition of the collectively fixed image archive.

During the creative process this collectively negotiated picture collection from newer and older books, magazines, newspapers and the internet interacts with the artist's individual image memory, as Gilles Deleuze made clear in relation to the painting process. Hertig chooses the images from her palette in alignment with the images fixed in her own memory. She combines images and varies the composition until they create meanings that accord with her knowledge of images. The definitive arrangement of the picture elements comes about through the unconscious comparison of her individual image memory with the physical archive of collectively fixed images available. In this process the combination of picture elements follows either a familiar constellation, in which a viewer can find a sensible combination of the parts, or the parts bring about a surprising confrontation through their encounter on the image surface, one which contradicts conventions, with combinations that the viewer cannot easily account for. In this sense Sabine Hertig's early, small-scale collages, which mostly consist of just two image elements, challenge the viewer by virtue of their decisiveness. While the photograph of a white-clad, dramatically foreshortened person fits formally very easily within the illustration of the landscape (Fig. 1), irritation arises from the fact that we cannot harmonise the landscape view and the figure in a familiar



**Fig. 1** Sabine Hertig, *Untitled*, 2010, analogue collage on paper, 24.5 x 18 cm.

scheme that would unite figure and context. Examining the collage, it strikes us that we can focus on either the landscape or the person, but we are not in a position to consider both images equally or simultaneously. Depending on our focus, either the person in white becomes a glacier, or the mountain hut becomes an abstract element that stands apart from the background of the recumbent figure. In this tilting tolerance of 'seeing as' a phenomenon can be identified that is decisive for our imaginative capacity (Wittgenstein, 1984). As a viewer, I experience how something seemingly familiar – a mountain landscape or a recumbent figure – can be seen as something else. The collage mentioned thus enables an aesthetic experi-

ence, part of which exceeds conventional meaning.

Further examples of small-scale works also play with the precise comparison of two contradictory perspectives, including one untitled collage (Fig. 2). Focus on the horse that walks along the mountain road at the centre of the image and the city landscape with its complex constructions becomes a tun-

**Fig. 2** Sabine Hertig, *Untitled*, 2012, analogue collage on paper, 27 x 20 cm.



nel roof from which cliff formations hang, whereas focussing on the urban landscape makes the mountain road appear to be a spatial element reaching towards the sky. In this example the 'seeing as' is crucially achieved by the formal qualities of the photographic images which allow one part of the picture to relate to the other in a meaningful fashion. The urban

landscape could not be transformed into a tunnel roof if the lines starting from the street crossing were not to represent a plane. Grey values and surface structures are pivotal for the phenomenon described; Sabine Hertig's process is thus distinct from purely semantically motivated selection criteria when creating a collaged image. Two elements can be described that are characteristic for observation of the small-scale collages. Firstly, a formal connection is a precondition, in order that the two image elements complement each other, displaying a relatedness in their tonal values and composition. This apparent match which creates the conditions for 'seeing as' is also the basis for the other level of observation. For secondly, despite their putative formal harmony, a confrontation occurs between the semantic contents of the two image parts. Viewers search for an explanation why the person and the landscape confront each other in this unusual form. The combination of country road and urban landscape cannot be decrypted with a simple explanation either, evoking a string of possible narratives and associations. In contrast with the large-scale collages, the photographic integrity of both image elements remains. The photographic images are cut out but each continues to be a representation of a scene.

#### THE PAINTERLY COLLAGE

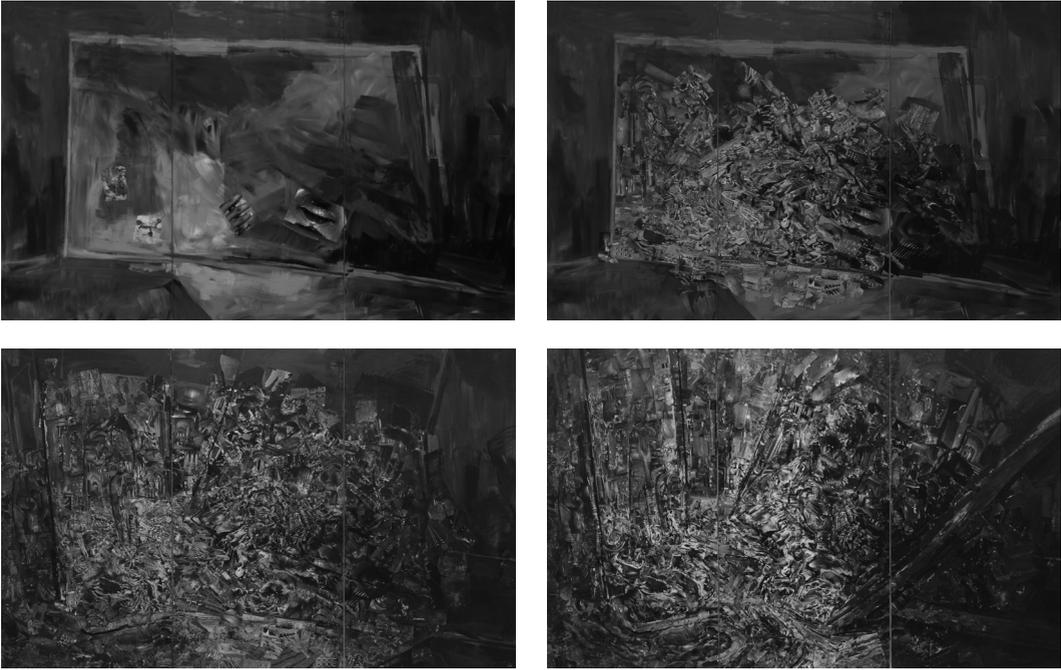
Building on the significance of the visual qualities of the image parts within small-scale collages as described, Sabine Hertig continues and extends her selection of images based on grey tonal values and image structure in her large-format Landscape works. In the foreground of the composition of these large-format Landscape collages is the interaction of the individual image parts in relation to the larger image and its spatial effect. As can be grasped from series of progressive images of the most recent large-scale Landscape images, the work begins with a painted underlying composition which the artist paints on the canvas with a brush in generous strokes of different greys before

she selects suitable image fragments and places them on top.

The documentation of the work *Landscape 14*'s creative process, which took place from February – December 2017, shows a first stage during which the three vertical canvases are linked by a lighter painted rectangle that stands apart from a darker painterly background. A spatial structure can be discerned here already. The rectangular area can be interpreted as an image within an image, or as a stage to which a lighter surface leads starting from the lower edge of the canvas (Fig. 3a). The first image pieces from the pool are placed on this painted ground. Selected image clippings become part of the whole image; structurally they often follow the texture of the brushstrokes applied in the first phase (Fig. 3b).

Unlike the small-scale collages discussed previously, clippings are glued over each other during the working process and the pieces are frequently cut in such a way that conclusions can no longer be drawn about the broader context they were taken from. As the work continues, the spatial structure of the painted base is not imitated as precisely as possible. Instead new spatial constellations emerge which occur as image elements are placed, to be recognised and ultimately elaborated (Fig. 3c/3d). So, bit by bit, an apocalyptic waterfall develops from the painted composition, bursting forth vertically on the picture surface with the brightest clippings and reaching the lower edge in a s-shaped, flowing mass. Cliff formations also appear to the left of the waterfall, contrasting with diagonal tectonics on the right-hand side of the picture.

We regard the roaring gorge of *Landscape 14* from a floating perspective and are, for now, at a safe remove from what is happening. Different viewpoints are decisive for these large-format works. Depending upon the viewer's proximity, they can have three different experiences of the image: (1) seeing the whole canvas, the spatial impression is conveyed, above all, of a fantastical landscape, one whose materiality reminds you of craggy formations, geological stratification or molten lava masses, not to mention fields



**Fig. 3a - 3d** Sabine Hertig, four stages of the development of *Landscape 14*, February – September 2017, analogue collage on canvas, 300 x 465.

of rubble or microscopic structures. Seen as a whole the image content of the individual clippings is meaningless. You are only conscious of each element as a part of the whole image; its concrete pictorial content is overlooked. (2) Examine *Landscape 14* more closely and individual images become recognisable. Here there is an arm, there a car or a statue, which rise to the surface out of the abstract texture and dispel the illusion of a total view of the landscape. At this level the viewer tries to make sense of how the particular images come together. A possible narrative that offers meaning in *Landscape 14* is of this apocalypse as a vision of the end of the world. (3) But a concrete interpretation, such as that of the apocalypse, is dispelled in the next stage of viewing. Observing the collage at close range, all the clippings are recognisable as photographic images, and the illusion of a landscape is entirely stripped away as clipped edges and overlapping become visible. When looking from up close, we recognise a dense web of juxtapositions of image content, like the juxtapositions so exemplarily isolated in the small-scale collages (Fig. 4).



**Fig. 4** Sabine Hertig, detail from Landscape 14, 2017, analogue collage on canvas.



**Fig. 5** Sabine Hertig, *Landscape 14*, analogue collage on canvas, three vertical sections, overall dimensions 300 x 465, 2017.

#### WORKSHOP OF THE IMAGINATION

If we return to the question of how unseen images are created, we cannot generate a formula even after an analysis of Sabine Hertig's collage process. But what distinguishes the artist's creative process is the unexpected conjunction of two traditional, and seemingly contradictory, approaches. In the

small-scale collages, thus, the focus lies on the formal structures of the image parts which create the basis for friction between the meaning of both parts. In large-scale works, on the other hand, the painterly method of dealing with images and image parts diverges from conventional collage process in which new statements are deliberately made through the combination of existing image content. The visually-led composition principle differs significantly from traditional, semantically informed figuration in the collage process. Examining *Landscape 14*, with its composition generated according to visual principles, a multitude of 'seeing as' experiences occur. The oscillation between appreciating a three-dimensional landscape and the dispersal of this illusion through the recognition of the individual 'scraps'. So, honing in on the question of where new images come from, we can describe an approach: invention lies in the numerous possibilities there are to develop creative processes, to transform and combine them, to superimpose and to customise them. This consistent, considered and intuitive way of dealing with a creative process holds the potential to create from our collective image memory and indeed to expand it with fresh input. And from this an artistic oeuvre can, in turn, over time, emerge. The place where new images are created is not, accordingly, to be found on a map, but a conscious engagement with creative processes enables some insight into the workshop of the imagination. Here materials, processes and the artist's physical actions are as much part of the emergence of unseen images as the collectively fixed, individually marked, image memory.

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# INSIDE IMAGE

## TECHNICAL NOTES FOR VIRTUAL STORYTELLING

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## ESSAY 23/01

VIRTUAL REALITY  
VIRTUAL STORYTELLING  
IMMERSION  
PRESENCE  
EMBODIMENT

The use of virtual reality (VR) to tell stories, and more specifically, the possibilities of constructing 3D spaces to be experienced through an Head Mounted Display (HMD) allows empathy levels that are difficult to reach through other mediums. These levels are concretized in some characteristic VR attributes so they can define different layers of immersion that can be funda-

mental in the narrative setting. Knowing how to distinguish these attributes by recognizing their peculiarities is the starting point for anyone who wants to experiment with VR design. Immersion, presence, embodiment, first-person shot, point of interest and continuity are some of the terms that need to be understood to approach new forms of VR storytelling.

## INTRODUCTION

With the commercialization of new and more effective head mounted displays (HMDs), the potential market for Virtual Reality (VR) has expanded massively. This expansion invites storytellers from traditional genres such as television, film, marketing and, of course, video games to take advantage of the new and effective storytelling techniques offered by VR.

One of the challenges that VR designers will face is the need to strike a balance between the user's agency and the narrative model adopted.

The most immersive VR experiences allow viewers to interact with environments and acquire a feeling of autonomy while making sense of them.

The traditional cinematic lexicon does not contain terms such as interactivity and agency. For this reason, it is necessary to introduce new metrics capable of understanding them. Additionally, storytelling in general needs to be revisited because the immersive experiences of VR have greatly expanded the narrative potential.

The use of virtual reality to tell stories, and more specifically, the possibilities for constructing 3D spaces to be experienced through HMDs, allows empathy levels that are difficult to reach by other mediums.

These levels are concretized in some characteristic VR attributes to define different layers of immersion, and they can be fundamental in the narrative setting. Knowing how to distinguish these attributes by recognizing their peculiarities is the starting point for anyone who wants to experiment with VR design.

## IMMERSION, PRESENCE AND EMBODIMENT

Immersion, presence and embodiment aren't new terms, and their definitions have been extensively discussed and de-

bated over the last 30 years (Shin, 2018; Cavazza et al., 2017; Slater, 2009)

Immersion is an objective condition determined in particular by the technological apparatus that is being used for the VR experience. It therefore depends on the ability of the VR system to trick our senses through the quality of visual, auditory or haptic stimulation. The stimuli provided in this way must deceive our cognitive system by “technically” transporting us to another place. With a high level of immersion, the sensory information provided in a VR system is almost identical to that we have in real life.

Presence instead refers to a subjective condition conformed on the basis of how much the user feels involved around the virtual environment. If the narrative structure involves it, if the modes of interaction are natural then the presence will be high. Presence does not depend directly on the level of Immersion and is fully pursued when technology completely disappears, and the user reacts to virtual stimuli as if he/she were in the non-virtual world. Finally, embodiment refers to the perception of physically interacting with a virtual environment. In traditional video games, interactive animation and three-dimensional navigation immerse a player in the 3D world represented. In this case, however, presence and immersion are not determined by stimuli to the visual and perceptual system but by cognitive and emotional elaboration processes that keep the user involved throughout the duration of the game experience.

When immersion involves a purely representative simulation of a 3D space, the perceptive experience obtained through movements in such spaces becomes an integral and essential part of gaining knowledge about the three-dimensional attributes of the model. In fact, there is no doubt that the perception of a single artifact or a built environment is resolved by visual perception, and therefore, the visual apparatus is involved only up to an extension of scale that allows the user to understand the environment at a glance (Antinucci, 2014).

When the dimensions are set to force the user to move his/her body, even if limited to the rotation of the head alone, then

the perceptive modes related to the sense of sight are integrated with those of the human body and its neuro-brain systems.

To obtain embodiment in a VR experience, a sensory-motor integration of sight and movement is necessary. Without this, the cognitive experience would be compromised. It follows the need to combine motion perception and wayfinding with the sense of sight because the ability to move and navigate are integral parts of direct space perception.

Therefore, presence, immersion and embodiment are opportunities that designers of virtual environments must understand in order to use a narrative model specific for the new medium.

#### WHERE AM I?

Anyone who has ever experienced an immersive virtual environment would have spent the first seconds frantically looking around, trying to figure out where they have been transported. In a VR experience, the fact that the question of “where” precedes the questions of “how” and “why” is one of the main elements that differentiates virtual reality and cinematographic fiction.

In virtual reality, location—whether hyper-realistic or imaginative—is of primary importance. From a narrative point of view, the VR space we experience is able to convey information the way a virtual character or an off-screen voice would. In 2013, interactive illustrator Daniel Ernst defined diorama as a type of VR experience based exclusively on visual discovery. He said, “I wanted to create a type of experience that would convey the sense of wonder the diorama in the Efteling did so perfectly well, and in the end, the design choices supported the name as well,” and “Each diorama is a fantastic hand-painted environment in which interaction is used to tell a story and convey a sense of wonder.” (Ernst, 2014). In one of these dioramas, Ernst draws an environment that reproduces a study by the Russian scientist, Alexey Pajitnov,

**Fig. 1** Screenshot from shoebox diorama *Blocked In* by Daniel Ernst.

creator of the puzzle game Tetris. The richness of the details along with the presence of the typical Tetris blocks that perceptibly fall into the external environment are the fundamental elements of a screenplay in which the story and the way of telling it converge in the setting (Figure 1).



About 200 years earlier, the pictorial panorama was conceived for image construction alongside which, a way of visually presenting such an image was also developed (Bordini, 1984). In fact, well before the development of viewers for virtual reality, the panorama and diorama were the first scenic artifices capable of representing the viewer being inside a simulated environment. Technically, these were large canvases painted and set up on a circular wooden wall so as to completely surround the viewer. The viewer would be at the middle of a cylinder, its inner face primarily depicting landscapes or scenes of war. The resulting effect was a com-

**Fig. 2** The Go-Pro camera rig used to shoot the first person perspective of the movie “Hardcore Henry” directed by Ilya Naishuller (2015). Credit: STX Entertainment.



plete enveloping of vision. Observing a panorama meant immersing oneself inside the painting and being isolated from the outside world because it was no longer possible to find the limits or frame of that representation. Similarly, the first nineteenth-century dioramas were able to introduce sophis-

ticated movements and plays of light to add dynamism and changes within the scene.

In Tricart (2017), David Liu, the former director of virtual reality at Viacom NEXT states that virtual reality is a spatial medium. He refers to virtual content creators as narrative architects whose role is not to geometrically shape the environment but to craft a world of narrative potential, enabling the environment to tell a story that would be interpreted by the user.

If we want to follow the cinematographic lexicon's indications, the use of VR for narrative purposes implies a definite contraction of the traditional compositional vocabulary.

Unlike the normal frame, the spherical space has no off-screen images. All the aspects become visible at the same time, and the viewer has to personally choose which portion of the field to frame each time with his/her gaze.

To understand virtual spaces, it may be more productive to introduce a new definition of off-screen, referring not to the shooting field, but to the viewer's field of view (FOV). It is clear that the centripetal action of the virtual image is not characterized by the traditional out-of-field as much as the virtual out-of-field, which must be identified in real time when exploring VR. An out-of-field image that is always potentially visible to users threatens the foundation of classical cinematographic scripts.

The virtual reality must therefore be exclusively expressed through full shots. Although the spherical space of VR is different from the role of traditional cinema, they share descriptive characters and the function of representing an entire internal or external space.

The technological peculiarities of an immersive virtual environment makes us reflect on some specific features of the narrative model to be adopted.

For example, determining factors such as hyperrealism derived from the sensitive enrichment of the viewer's sensory experience or the ultra-spectacularity in overcoming the limits of the traditional screen have become the main

constituent elements of new experiential VR modes (Rossi, 2017). These factors were fueled by certain contingencies such as the commercial interest in wearable HMDs, the miniaturization of shooting technologies and action cams, the worldwide success of some FPS video games and the release of movies visually based on first-person shots and single long takes (Figure 2).

Another feature of narration in VR is the typically paratactic trend. Each environment is directly dependent on the FOV made available by HMDs and each slice of the immersive sphere is independent from each other.

Unable to handle a traditional narrative formula, VR uses cinematic language to show a scene rather than telling the user about it. Thus, the storytelling in VR comes closer to a stunning graphic edit than a traditionally articulated sequence of events and scenes.

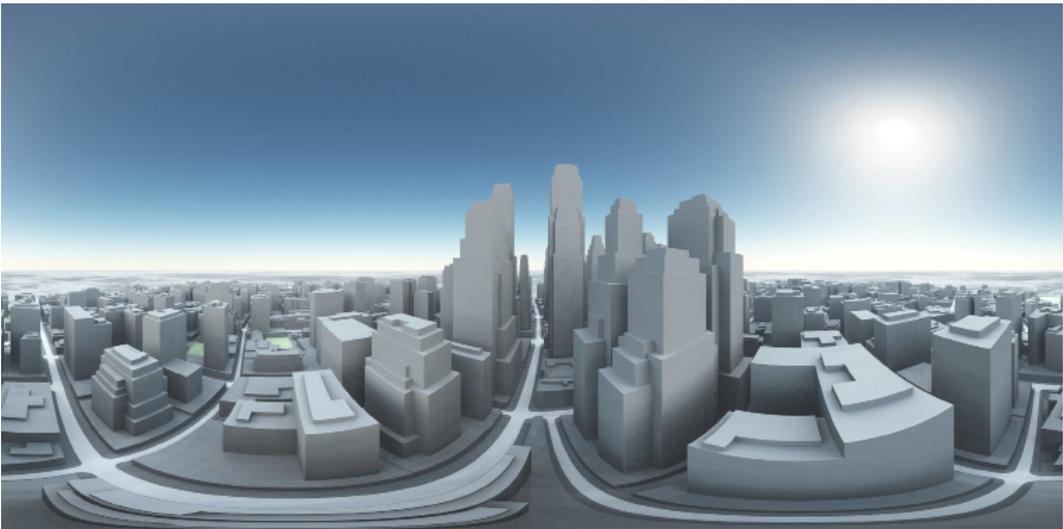
#### WHO AM I?

After wondering, “Where am I?” the user usually questions his/her role within the virtual space and whether he/she is an active part of the story or a silent viewer.

Therefore, after a quick initial exploration, the users tend to look for something to focus on. These are the points of interest (POI). Points of interest are elements that attract a visitor’s attention within a VR experience. Some are extremely easy to find, such as colored geometric primitives on a completely black graphic field, while others are a lot more difficult to find due to the absence of preponderant graphic elements with noticeable shapes, sizes or chromatic contrasts (Figure 3).

During a VR experience, the visitor’s attention shifts from one POI to another in a chain of eye or head movements depending on the virtual content designer’s placement of POIs within the scene. This guides the viewer’s attention and consequently silently directs the visual storytelling. When the POIs are not graphically evident, clues are introduced to help trace them. Such clues can be small animations or color changes as well as audio effects or music tracks.

The designer's skill lies in the ability to hide such clues. If they are too evident, they would break the user's illusion of being alone in an unknown environment. On one hand, disseminating cryptic clues would make it more difficult to construct a sense of visual storytelling; on the other hand, expending greater cognitive effort would enhance the user's virtual immersion (Brillhart, 2016).



**Fig. 3** In this equirectangular 3D illustration the group of skyscrapers in the center represents the only POI. Credit Stanislav Rykunov @ Dreamstime.com.

When more than one POI is present in the virtual environment, being prompted to make an effort could lead to the user being overly engaged in interpreting clues due to the fear of missing out (FOMO) on something important in the story rather than enjoying the virtual experience (Figure 4).

FOMO can be a dangerous tool that's capable of expelling users from the immersive experience because they would find themselves "leaving" the narrative environment to observe their actions. It can also be an excellent narrative stimulation device to create anxiety and stress in the user or to force the user to repeat an experience several times to complete every part of it (Tricart 2017).

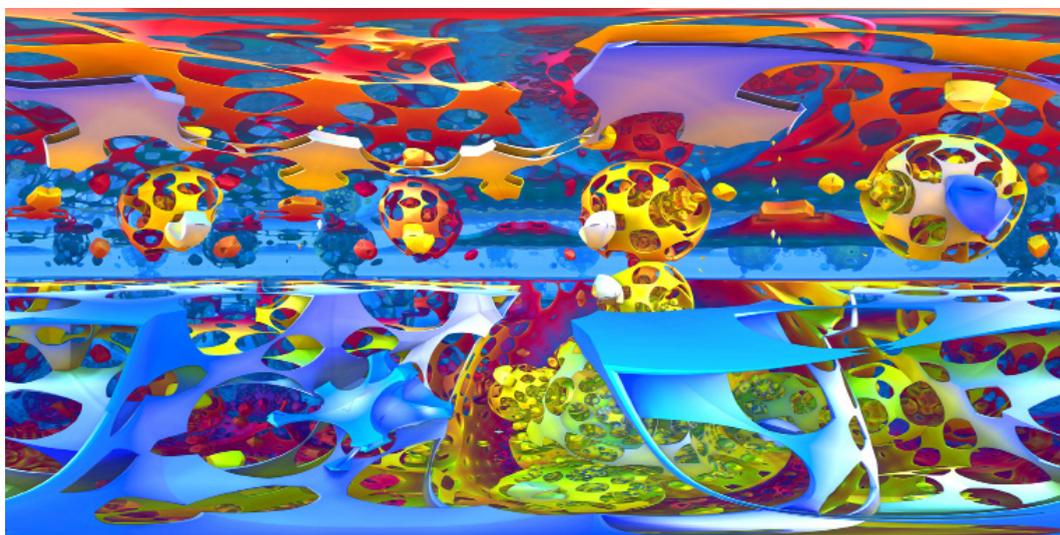
Therefore, FOMO is the basis of a non-linear narrative mode where all the POIs on the scene are consumed not in a precise order but according to the sensitivity and experience of each user.

## AESTHETIC OF CONTINUITY

The remediation process triggered by the digital revolution is characterized by attributes such as fluidity and dynamism. From the logic of postmodern pastiche that dominated artistic and cultural production in the 1980s, we moved on to the multimedia paradigm in which codes from a multitude of media objects overlap in a continuous flow of information.

Another founding characteristic of VR storytelling was derived from this remediation: continuity. It was developed when the artistic production in the early nineties' digital revolution began to transform the world of communication and define new aesthetic and cultural canons. The aesthetic category of continuity is dominant in the three-dimensional drawing practices of interactive virtual spaces. In fact, the exploration of these spaces is articulated in an uninterrupted manner and without editing cuts. Lev Manovich (2002) identifies this lack of editing as the primary linguistic convention that best suits the first-person narrative modalities of the immersive virtual space experience.

**Fig. 4** In this equirectangular 3D illustration the many shapes and bright colors can generate a fear of missing out (FOMO) in the viewer due to the richness of detail and potential POIs. Credit: Pitris @ Dreamstime.com



According to him, the digital paradigm shifts from the tradition of representation, qualified by the presence of a frame/screen, to the tradition of simulation, characterized by the absence of a reduction scale; this causes the physical space to coincide with the virtual one.

The lack of editing becomes a precise compositional strategy wherein first-person navigation prevails, and it also suggests the use of a shooting technique borrowed from film grammar: the long shot, which is a shot that performs the functions of a sequence or scene on its own. In other words, a single shot completes an entire narrative sequence without the need for editing.

Continuity can therefore be considered as another intrinsic attribute of the virtual image, characterized by the high degree of subjectivity of the shots.

The size and shape of the HMD screen strategically activates the viewer's peripheral vision and strongly intensifies the illusion of reality. The VR visitor becomes actively immersed in the simulation of a "real" space rather than passively enjoying an audiovisual document.

Ruggero Eugeni (2015) defines the first-person shot as a symbolic form and more precisely, "a ubiquitous and almost omnipresent figure within the intermediate and post cinematic galaxy that characterizes contemporaneity". The POV shot, which represents a well-defined shooting technique in film grammar, is combined with domains and experiences from the world of FPS video games and has become a symbol of a visual culture characterized by perceptive habits dominated by first-person experiences.

Therefore, the first-person shot contains enormous potential for different ways of unveiling 3D environments. Exploration with the personal point of view improves the geometric perception of three-dimensional models. The stereoscopic visualization of the latest HMD generation, combined with the ability to move freely with this point of view, improves the user's ability to understand the spatial quality of the places in which he/she is immersed.

Any environment can therefore be experienced as if

the user is actually inside it. The user can virtually move around in the 3D scene by approaching, moving away or turning their head. In other words, one can benefit from a system of simulation of possible movements in space through a natural intuitive interface such as the human body.

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# IMAGERY AND IMAGINATION IN PSYCHOLOGICAL SCIENCE

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## ESSAY 24/01

IMAGERY  
PSYCHOLOGY  
COGNITIVE PROCESSES  
PERCEPTION

Imagery and imagination are different mental abilities but the boundaries between them are not always clear. From a psychological perspective, imagery and imagination partially share the same underlying neural structures although referring to different mental processes. In both cases, the underlying ability is to create a internal representation, like a picture or a

film that is “projected” in our mind. Seeing with the mind’s eye, as it has been defined. However, while imagination preferentially refers to dream-like processes, imagery have stronger cognitive grounds and may be defined as the ability to generate, transform and manipulate mental representations involving visual and/or spatial characteristics.

What is an image? From a subjective, introspective point of view, the answer to this question is relatively simple. It is like a picture in our mind, something similar to seeing an object, but we can see it with our eyes closed. From a psychological perspective, the answer is not that simple: Is our mind able to generate a completely new image or just capable to re-activate a trace of what we have in memory? Is an image identical to a visual percept? Can we manipulate, transform, generate an image? Dreaming is a sequence of images like cartoons or old films are sequences of pictures?

If we go back to the history of psychology, Greeks and Romans already discovered the power of images. At a time in which memory and knowledge had a critical value in defining the identity of an individual, they had to understand how memory works and how to improve it (see Yates, 1966). It has been easy to understand that a visual representation of an object (i.e., an image) was easier to remember than the single word. This basic concept has been widely used by the Romans who developed various mnemonics (the method of loci is probably the best known of all) based upon the visualization of the to-be-remembered material. Cicerone described the use of images in improving memorization in his work "De oratore" and this can be seen as the first text trying to give a formal account of the relationship between images and memory. Since then, this connection has always been recognized as a tool to understand and improve memory abilities and it is still widely used in the development of learning and memory strategies for cognitive rehabilitation (e.g., in aging or following neurological damage).

With the advent of experimental psychology, the theme of images started to become a distinct area of investigation of human cognition. Galton in 1883 dedicated a whole chapter of his book to imagery, as the human cognitive function associated to mental images. However, after his initial observations, psychological research forgot to deal about images for nearly a century. Around the sixties, for the first time Brooks (1968) demonstrated that verbal and visual

processes are clearly independent in our minds. Around the same years, Allan Paivio (1971) showed that words and images are processed separately and this may facilitate memory. What was empirically proved by the Romans, eventually found a scientific demonstration through the Dual-Coding theory, suggesting that two codes (verbal + visual) are better than one when it comes to remembering. In turn, Paivio also showed that words may have a different imagery value, that is may evoke images with different vividness or, in some cases, cannot even lead to a corresponding image. An example of the former effect can be found if we try to compare an image of Italy vs. Australia. It is likely, if one has not just been in Australia for a beautiful holiday, that our mental representation of Italy is more precise, rich in details and we may even see the colors of the different region that we studied at primary school. In a word: the image of Italy is more vivid. An example of the latter category is instead the comparison between an image of a chair and of truth. Can we generate an image of truth? To some extent is probably possible, but clearly the imagery value is very low. Paivio's theory explained why to higher imagery values correspond higher percentages of recall, i.e. a better memory.

Psychological research on imagery had a new impulse with the works of Steve Kosslyn in USA and, later, Bob Logie in UK. Kosslyn (1980) studied human mental images and he always concentrated on the idea that internal images are identical to visual percept. Imagery is seeing with the mind's eye and mental images share the same properties of visual inputs. Few years later, Logie addressed this same issue from a very different perspective. Surely, we can think of an image as the immediate internal representation arising from visual inputs. At the same time, we can generate a mental image from our memories (a poster I have/had in my room) or even produce a non-real, fantastic image (a pink elephant). Logie (1995) interpreted imagery as a memory function, and more specifically as a portion of the working memory system suggested by Baddeley and Hitch in 1974. Different authors continued to

develop one theory or another (see also Cornoldi and Vecchi, 2003), although, for most parts, the two ideas are largely compatible and they mainly refer to different inputs (internal vs. external) that may lead to generate a mental image.

Nowadays, imagery still have a place in psychological research, mainly helping to address the issue of the nature of mental representations. A mental representation is a more complex semantic concept in which visual and spatial characteristics may play a great role but also interact with different sensorial information (haptic, smell, taste) and continuously referring to semantic knowledge and long-term memories.

In sum, imagery is a complex cognitive function that can be considered not only as a function by its own (i.e. a mental image sharing visual and spatial characteristics), but also for its relationship with numerous other abilities such as perception, memory or attention. A mental image can be more or less vivid and we can also use it as a medium for reasoning and thinking. In some languages, there is not even a translation of the word imagery. The meaning of two clearly distinct words, such as imagery and imagination, are collapsed in a unique term, often referring to what imagination is (in Italian, for example, the only possible translation is *immaginare* and it refers to imagination). In fact, imagery conveys quite a different meaning from imagination (daydreaming, future thinking,) and we all know that thinking of a long holiday in Australia is – often – an exercise of imagination, whereas the decision of an alternate route in a traffic jam is more than imagination. It is imagery!

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# VISUAL CULTURE IN QUANTUM MECHANICS IMAGE-BASED KNOWLEDGE MAKING IN A NON-INTUITIVE WORLD

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## ESSAY 25/01

VISUAL CULTURE  
QUANTUM MECHANICS  
IMAGE-THINKING

According to a large portion of scholars, mainly coming from the fields of theoretical and experimental physics, quantum mechanics is a particularly challenging subject both to be translated into images and to be communicated without an extensive visual apparatus. This ambiguity is directly connected to the original principles of subatomic physical theories and its peculiar knowledge making routine that, historically, associates mathematical theoretical framing with iconic modeling and analogies storytelling. This research deals with some emblematic issues of quantum theories retracing some branch of image-based quantum modeling with particular atten-

tion to the visual knowledge-making that underlie the physics of subatomic particles. These examples allow to build a rhizomatic genealogy of graphical interpretations that goes back to first the atom sketches drawn by Rutherford in 1910, at the dawn of the conceptualization of electron nucleus relationship and find its maximum expression in the huge graphic and drawing production of Nobel laureate Richard P. Feynman. We know that the great majority of the quantum phenomena are hardly describable beyond the equations and the probability calculations, however the visual languages continue to play an important role in particular within the communication, training and physics learning processes.

*Scientific thought is a development of pre-scientific thought.*  
A. Einstein

*There are only a few images that are not forced to provide  
meaning, or have to go through the filter of a specific idea.*  
J. Baudrillard

## IN THE BEGINNING WAS THE IMAGE

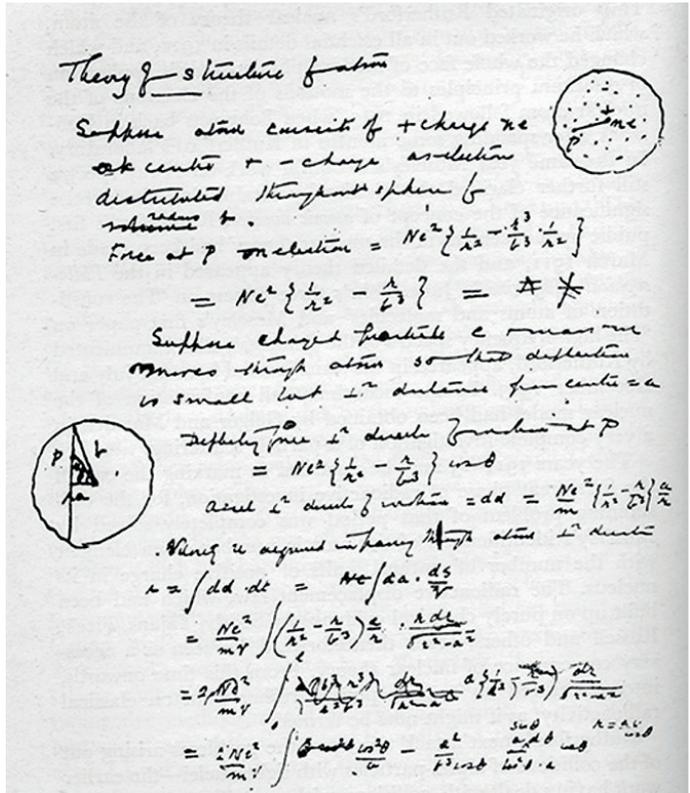
For just over a hundred years the physical sciences have been coming to terms with two pillars that have brought together the entire history of knowledge: the Theory of Relativity and Quantum Mechanics. These are two essential and correlated joints that have rewritten first the whole Newtonian physics and have set the stage for particle physics, leading to the experimental discovery without which much of contemporary technology would not be possible. Both theoretical bodies, which still today are not entirely mutually consistent, are triggered by a series of new visions, models, and analogies in an attempt to understand and reconstruct the behavior of elementary particles and their relation to macroscopic phenomena. It is above all a matter of great intuitions: Einstein is notoriously the first of the early twentieth century visionaries to whom we owe the compact and elegant elaboration of the theory of relativity, but we cannot forget the propulsive and imaginative force of the great number of scientists and Nobel winners that, starting around the 'father' Niels Bohr, have assembled step by step the bricks of today's Standard Model. In the following paper I would like to try to trace some elements that connect the way to build knowledge around just a few of the nodal problems arising from the interweaving of the Relativity revolution and that of Quantum Mechanics.

In particular I will try to connect some examples that show the central importance of the visual processing and the image-based modeling in the construction of quantum physical foundational knowledge, starting from the operational ne-

cessity of drawing as an 'only-apparently' neutral language.

There is no denying it: the most common basic knowledge of the atomic world is, first of all, visual. The simple planetary model of the Bohr atom, with its iconic nucleus of neutrons and protons, and the globes of electrons on circular orbits, is indelibly engraved in our optical memories: pity that it is a completely inconsistent visualization with respect to the theories of Bohr himself and all successive developments. It is not a question, in this case, of discussing the effects of quantum theory on popular culture, but of trying to undermine some common places still present in the same scientific community of contemporary physics that sometimes tend to confuse and overlap the aesthetic-artistic values of visual-conceptualization than maieutic-hermeneutic ones. Nonetheless there is the need to investigate personal research approaches that are very different from one another, even when the final results are common. That modern physics owes much to geometric and visual abstraction is a fact, however it is necessary to understand how the two revolutions of physics at the beginning of the twentieth century have changed the relationship between the construction of scientific knowledge, the scientific dissemination and the growth of a collective imagination. To grasp some of the most significant aspects of the question it may be useful to focus on some of the steps that led to the birth of the current Standard model and to leave in the background the centenary debate concerning the conflicts that cause general relativity to collide with quantum mechanics. The main reason for this choice concerns an evident need for subatomic sciences to use visual language to hypothesize new interpretative models, in a world of the extremely small, where almost nothing is literally and really 'visible'. However, scientific modeling involves a series of cognitive and theoretical actions that lead to the formulation of a new 'overview': "A scientific model is a conceptual system mapped, within the context of a specific theory, onto a specific pattern in the structure and/or behavior of a set of physical systems so as to reliably represent the

**Fig. 1** A page of Rutherford's early undated (1910) rough notes, with the first sketch of the electron-nucleus structure of the hydrogen atom, from Birks, 1962, p. 70.



pattern in question and serve specific functions in its regard.” (Halloun, 2004, p.131) One of the hypotheses of this work is that the ‘mapping of a conceptual syste’ is indelibly linked to the visual forms with which this system is initially processed.

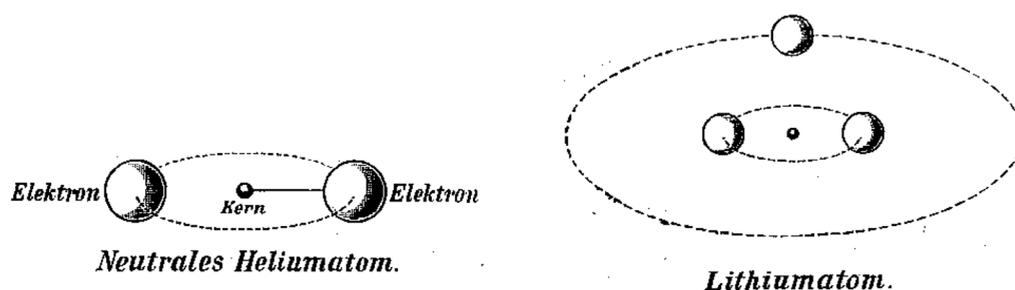
In many ways it is perhaps useful to start with the atom. The first visual model of an atom as now conceptually and mathematically understood can be found in a sketch by Ernest Rutherford of 1910. It is a radical new representation, the result of the reworking of a long experimentation made by Hans Geiger and Ernest Marsden bombarding a gold sheet target with  $\alpha$ -particles, described in this way by Rutherford himself: “The atom is supposed to consist of a central charge surrounded by a uniform distribution of the opposite sign through a sphere of radius  $R$ .” (Rutherford, 1911, p. 669).

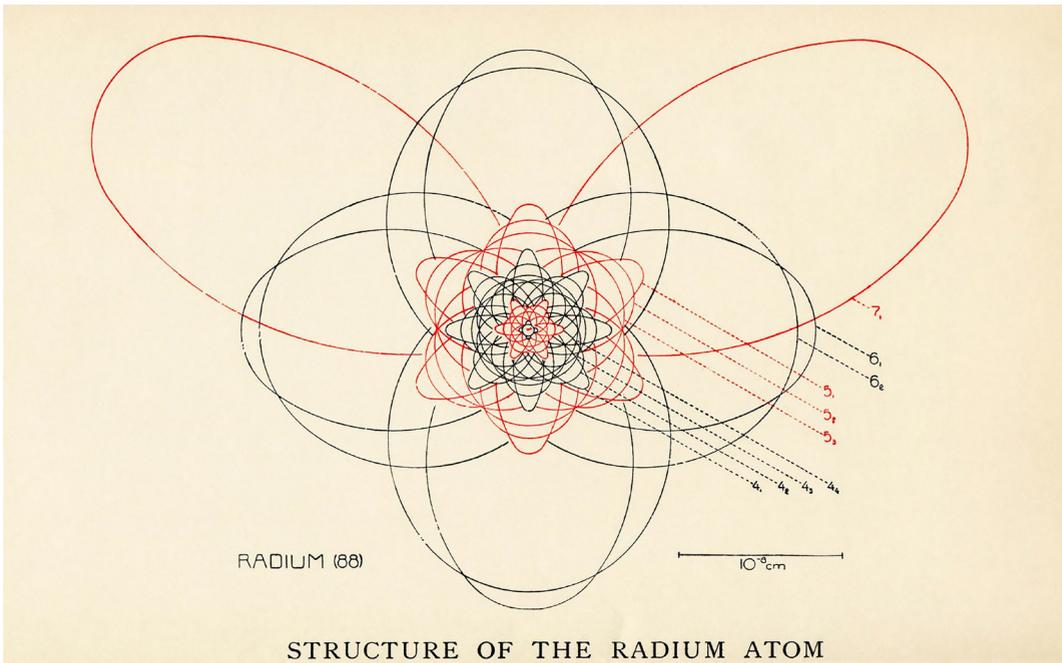
It is quite clear how fundamental is the visual asso-

nance with a planetary system and also why an image so revolutionarily simple has remained fixed in the collective imagination well beyond the demonstration of its ineffectiveness. The entire page of Rutherford's notebook (Fig. 1) is a fascinating interpretative apparatus: a set of annotations, equations, small geometric vector patterns and a single 'foreign' drawing to the accuracy of scientific discourse, a small dirty and inaccurate sketch that will change the course of the history of modern scientific thought. As we know, the first image of hydrogen, the simplest of atoms, is a visual conceptualization that simplifies and abstracts theoretical mathematical considerations, and indirect proofs to capture the essential features of a new interpretation, however it is very curious to see how the application of the model to other atomic systems, as in the case of uranium, make a late nineteenth century visual cultural milieu, dominated by the order of Euclidean geometry, re-emerges powerfully.

The power of these symbolic atom images (Fig. 2) born within a precisely connoted scientific cultural context around the Copenhagen school, turned out to be much more long-lived than the theories that led to its elaboration. Anyhow much of the popular work has been accomplished through a very successful scientific text coauthored by Danish science critic Helge Holst and Dutch physicist and collaborator of Niels Bohr, Hendrik A. Kramers: *The Atom and the Bohr Theory of its Structure*, first published in Danish in 1922, the year in which Bohr received the Nobel Prize, and then translated into

**Fig. 2** The Bohr model of helium and lithium, Graetz, 1918, note 19.





**Fig. 3** The first image ever of the Structure of the Radium Atom, from Kramers-Holst, 1922, table 2.

English and published worldwide between 1923 and 1925.

The Kramers-Holst book has, among other things, two peculiar characteristics: on one hand it tells with scientific accuracy, but without a great use of mathematical modeling, the phases of the work through which Bohr reaches the formulation of his atomic model; on the other, for the first time ever, in two famous final tables it uses the geometric drawing to visualize the patterns of the fascinating and complex structure of the 88 electron orbits of a radium atom nucleus (Fig. 3).

These are images that Bohr himself will use to present his theories to the scientific community until the end of the 1920s although their strong simplification represented a double-edged sword: it allowed an intuitive pictorial summary but hid all the uncertainties of a highly counterintuitive and completely distant from the static nature of classical mechanics physical reality: “While the general public, when presented with the Kramers-Holst pictures, could hardly avoid believing that these were nearly authentic

representations of what atoms really look like, specialists in atomic theory were well aware that a model should not be confused with reality. Although Bohr and Kramers considered the pictures as symbolic rather than concrete representations, still in 1923 they had little doubt about the reality of the electron orbits. Sure, the atom did not look like the picture, but it might still be something like it.” (Kragh-Nielsen, 2011, p. 45) For the first time, with this text, a great work of reducing the divide between the most recent elaborations of particle physics and collective knowledge is taking off. The scientists of the Copenhagen group and their successors continue to deal with a mostly incomprehensible world, completely away from everyday perceptions, partially explained by a complicated mix of mathematical language, non-Euclidean geometries, non-visual models:

“The new physics and mathematics made it clear to everyone that scientific knowledge was difficult to access, bordering on the incomprehensible. Whereas, previously, popular science could be seen as an extension of scientific epistemology in public domains, the new physics required translating sophisticated mathematics and highly technical language into everyday language and simple cognitive models, such as images of the atom as a planetary system.” (Kragh-Nielsen, 2011, p. 4). Bohr and Kramers knew perfectly that the orbital representation of the atom is nothing but a symbolic simplification, but they also understood the communicative value of these new images.

A few years were enough for guy for the youngest Pauli and Heisenberg to theorize a more radical and complex atomic structure even more difficult to become an image, refuting the existence of real electron orbits. Shortly thereafter with De Broglie and Schrödinger the first visual metaphor becomes completely broken: electrons prove to exist only when they interact with each other, they are clouds of probability with a density given by the solutions to the three-dimensional Schrödinger equation. Why, working with the increasingly intricate, multidimensional,

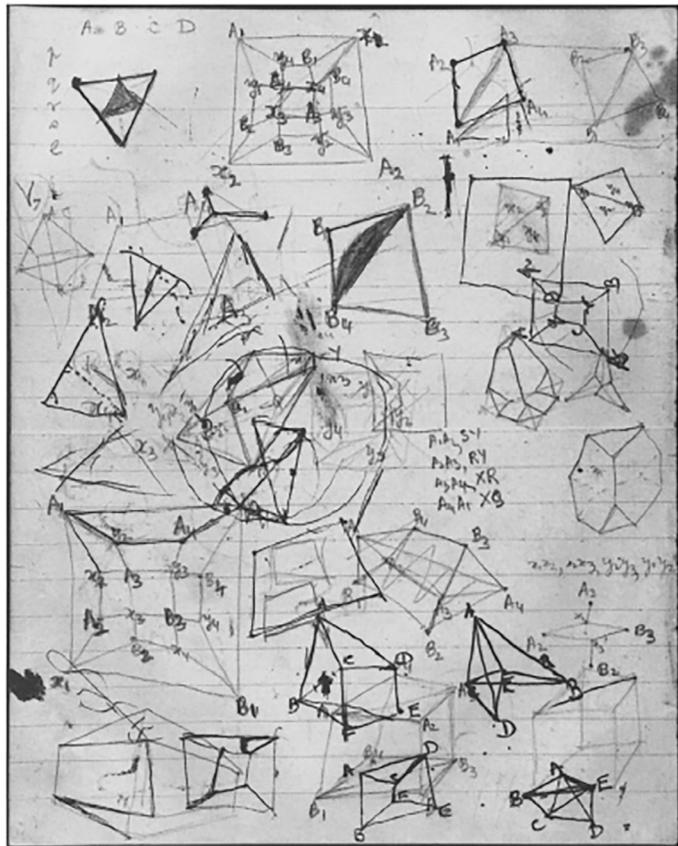
counterintuitive and probabilistic subatomic world, scientists have continued, throughout the 20th century, to 'play' with visual languages, making it appear even when it seemed only the legacy of nineteenth-century mechanistic culture? Some answers to this question come to us directly from the scientific *modus operandi* of several of the major physicists of the second half of the century. It is commonly believed that two of the great fathers of the space-time revolution like Minkowski and Einstein were a visual thinker, although with different approaches:

"If Einstein may be said to have thought in concrete visual terms, running thought experiments through his mind, Minkowski thought in geometric visual terms. Where Einstein manipulated clocks, rods, light beams, and trains; Minkowski played with grids, surfaces, curves, and projections." (Galison, 1979, p. 40) but it could be fruitful to try to go further, for example by looking for 'the visual', in a broad sense, in the scientific attitude of Paul Dirac or Richard Feynman. Dirac and Feynman are just two of the possible examples, but they represent two ways of constructing scientific knowledge that are very distant from each other, while dealing with liminal quantum issues. They're two very prominent scientific personalities, both Nobel laureates, both central figures in the elaboration of the Standard Model, both sharing an unexpected interest in the world of images and drawing, although with different attitude and implications.

#### DIRAC'S INTIMATE GEOMETRICAL IMAGE-THINKING VS FEYNMAN'S ICONIC ENTHUSIASM

Paul Adrien Maurice Dirac was an eminent theorist, one of the most brilliant mathematicians of the last centuries, we owe to his theoretical work some of the most important theoretical discoveries in the field of particle physics, such as antimatter. Dirac frequently declared his great interest in projective geometry, explaining its importance

**Fig. 4** P.A.M. Dirac, Geometrical Sketches, in Galison, 2000.



in terms of capability to interpret complex spaces, starting from curved ones: “Any kind of geometrical picture may be quite unworkable; there might be too many variables; too many to mention, so that it is quite hopeless to try to think of it. But usually so, there might be parts of the work which can be pictured geometrically, and I find that I can get a great deal of help by using these geometrical pictures whenever possible; the pictures bring out clearly, in my mind, the relationships between the quantities and point the way to getting further relationships.” (Dirac, 1972, p. 2)

Peter Galison’s seminal research (Galison, 2000) allows us to grasp a nodal and odd aspect in Dirac’s way of researching: on the one hand strongly image-based and on the other monolithically mathematical and anti-visual.

Projective geometric thought remains a personal, private tool for Dirac: his intricate and beautiful sketches are the thread of Penelope in his own intellectual labyrinth (Fig. 4).

“These pictures were not for pedagogical purposes: Dirac kept them hidden. They were not for popularization even when speaking to the wider public, Dirac never used the diagrams to explain anything. Astonishing: across the great divide of visualization and formalism that has, for generations, split both physics and mathematics, we read here that Dirac published on one side and worked on the other.” (Galison, 2000, p. 146)

The reasons for this dichotomy are many, but the need to understand the plurality of ways in which the use of images remains quintessential. In any case Dirac’s scientific behavior helps us to highlight a non-secondary aspect: the multiple intertwined paths of modern and contemporary quantum physics do not exclude nor contrast the rigid logic structure of the mathematical language with the instinctive persuasiveness of the images. It is therefore not a question of an opposition; visual thinking is one of the ways in which the new models of the subatomic world are first elaborated and then disseminated. Yet these considerations does not allow us to simply dismiss the issue.

How is it possible within a world so intrinsically anti-visual and non-intuitive that the apparatuses of knowledge production are still so tied to our need for images? And again: why the approach of individual scientists to the visual culture problem is so strongly different? Some further clues can be offered by the mind and the prolific drawing hand of Richard Feynman. Feynman is basically a mythological figure in the scientific world starting from the immediate post-war period. His reputation is not due exclusively to his work and his discoveries, but also to his very personal way of teaching and disseminating challenging topics such as the electrical interactions between elementary particles and the foundation of quantum electrodynamics. Observing him from the point of view of his relationship with visual imagery Feynman could be stigmatized as a particular kind of ‘anti-Dirac’.

**Fig. 5** R. Feynman, equations and sketches, from Feynman, R., & Feynman, M., 1995.

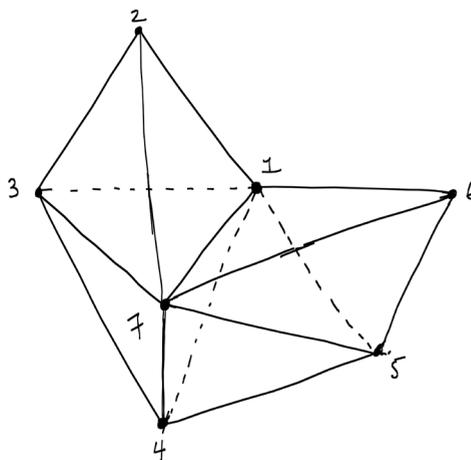


All the aspects of the drawing are pervasive in his work and it is precisely thanks to the conceptual simplification of the symbolic drawing that will come to the formulation of his famous diagrams. His schemes build a visual graphic translation of the interaction between particles, making a long sequence of mathematical formulas understandable and communicable. These representations work in a radically different way than the visual model of the Bohr atom: they schematize a particles behavior, simplify the boundary variables to capture the essence of a quantum interaction. They do not try to explain how a subatomic entity looks like, but they build a visual demonstration of how some subatomic systems interact with each other. If in quantum physics everything is interaction the images (for whatever purpose they are used) always partially capture the complexity of the problems, they are a first step or a step after the mathematical formulation, they only freeze the possibility of a stable solution. Synthesizing this point with Wittgenstein's words we could say: "The picture depicts reality by representing a possibility of the existence and non-existence of atomic facts.", and again: "The picture contains the possibility of the state of a airs which it represents" (Wittgenstein, 1922, 2.201, 2.203)

There is something that is both steady and unbalanced in the representation of images of the physical world, and the universe of the extremely small become even more complicated: also for this reason it is necessary to clarify the way in which scientists themselves use images, this can help us to understand more clearly the role of imagination in a field only apparently enclosed in mathematical exactitude.

From this point of view Richard Feynman is a real well of surprises: his almost tactile interest in the uncertain world of images (Fig. 5) led him to start drawing not only on the blackboards of his lessons (Feynman, 1995). In the final part of his career he becomes an excellent draftsman, well beyond the frontiers of physics. His diaries are full of portraits, bodies, faces, places in a creative crescendo that always has the drawing as an expressive pivot.

**Fig. 6** The amplituhedron, from Arkani-Hamed, N., & Trnka, J., 2014, p. 7.



Condensing Feynman's work, running the risk of violent simplifications, also means appreciating the great variety of creative uses through which he let visual thinking guide his knowledge making: from the intuitive elaboration of concepts to the schematic formalization, from the nebula of contrasting images to communicative graphic coding.

#### MORE AND MORE INVISIBLE, MORE AND MORE IMAGINE(D)

These two prominent examples are actually just the tip of the iceberg that deserves persistent re-elaboration starting from an essential thought: to imagine how things can be and how physical systems can work means first of all looking for a supposed *visualizability* (Miller, 1984), no matter how impossible it is to be satisfied with the result. We are guided by a necessity which is also an anthropological and cognitive limit: a visual seduction that can only be transformed into an effective knowledge tool through great critical awareness. Moreover a perceptual and semantic short circuit must be reversed: it is not essential to understand first how im-

ages look but what they can do, how and where they can help us and above all how to weaken their core limits. Current developments in quantum physics are a very rich visual testing laboratory: the most advanced and still young theories (supersymmetries, strings and quantum gravity) deal with areas of matter that are too small to be indirectly displayed or too far away for today's instruments, putting a strain on the scientific need for experimental confirmation.

However, we are constantly looking for achievable images: as in the massive collaborative work that led to the elaboration of the first 'photo' of a black hole. It is also thanks to the work of dozens of physicists visual-thinkers that we have freed ourselves from the misunderstanding, of a nineteenth-century rationalist matrix, that assigned a neutral and objectifying value to the images. In today physics visual languages have dozens of operative and communicative declinations and images have not at all 'stopped working', indeed they reappear inside the most unexpected theoretical toolboxes.

A symbolic case is the powerful visual intuition of the amplituhedron. It is a geometric-visual matrix calculation tool, introduced in 2014 by the theoretical physicist Nima Arkani-Hamed which allows an incredible simplification in the calculation of interactions between elementary particles. Arkani-Hamed completed and leads to unexpected consequences the visual modeling of Feynman's elementary interactions proposing a visual shortcut, making technically possible calculations that previously were not.

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# DESIGNING IMAGES IN GRAPHIC DESIGN QUESTIONS OF MEANING

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## ESSAY 26/01

BASIC DESIGN  
DIGITAL GRAPHICS  
GRAPHIC DESIGN  
SOCIAL BRANDING  
VISUAL DESIGN

Respecting the interdisciplinary and collective nature of the journal, this article proposes a reflection on the value of the image. The reflection is focused on the area of graphic design in relation to two significant commercial and technological contexts, and on the theoretical foundations that par-

ticipate in the construction of the image. The assumption, which is supported here, is the ethical role of the image, viewed with an eye to the past and a projection towards the future, considered within the academic area for a manifesto aimed at the construction of meaningful images.

## INTRODUCTION

Respecting the interdisciplinary and collective nature of the journal, this article is an open reflection on the focus it has chosen to pursue, which is to consider, from a multiplicity of points of view, “images for what they are, their conception, their production, their perception”. In particular, the context this reflection addresses is graphic design, in relation to two significant commercial and technological contexts, and to the theoretical foundations that participate in the construction of the image. The assumption, which is supported here, is the ethical role of the image, viewed with an eye to the past and a projection towards the future. A future that, within the limits of this contribution, is considered within the academic area, and the outcome of which will appear as a manifesto aimed at the construction of meaningful images.

“THE SPIRIT IS STIMULATED MORE SLOWLY  
BY THE EAR THAN BY THE EYE”

In 1982 Ernst Gombrich published his acclaimed book *The image and the eye*, which includes an interesting article titled “The visual image as a form of communication”, published some years earlier in a special issue of *Scientific American*. This article is particularly significant for the considerations that will be developed here and for the conclusions towards which this article will aim. We would therefore like to begin with an ample excerpt, which we believe will serve as a proper “incipit”: “Ours is a visual age. We are bombarded with pictures from morning till night. Opening our newspaper at breakfast, we see photographs of men and women in the news, and raising our eyes from the paper, we encounter the picture on the cereal package. The mail arrives and one envelope after the other discloses glossy folders with pictures of alluring landscapes and sunbathing girls to entice us to take a holiday cruise, or of elegant menswear to tempt us to

have a suit made to measure. Leaving our house, we pass billboards along the road that try to catch our eye and play on our desire to smoke, drink or eat. At work it is more than likely that we have to deal with some kind of pictorial information: photographs, sketches, catalogues, blueprints, maps or at least graphs. Relaxing in the evening, we sit in front of the television set, the new window on the world, and watch moving images of pleasures and horrors flit by. Even the images created in times gone by or in distant lands are more easily accessible to us than they ever were to the public for which they were created. Picture books, picture postcards and color slides accumulate in our homes as souvenirs of travel, as do the private mementos of our family snapshots. No wonder it has been asserted that we are entering a new historical epoch in which the image will take over from the written word” (Gombrich, 1985, p. 155).

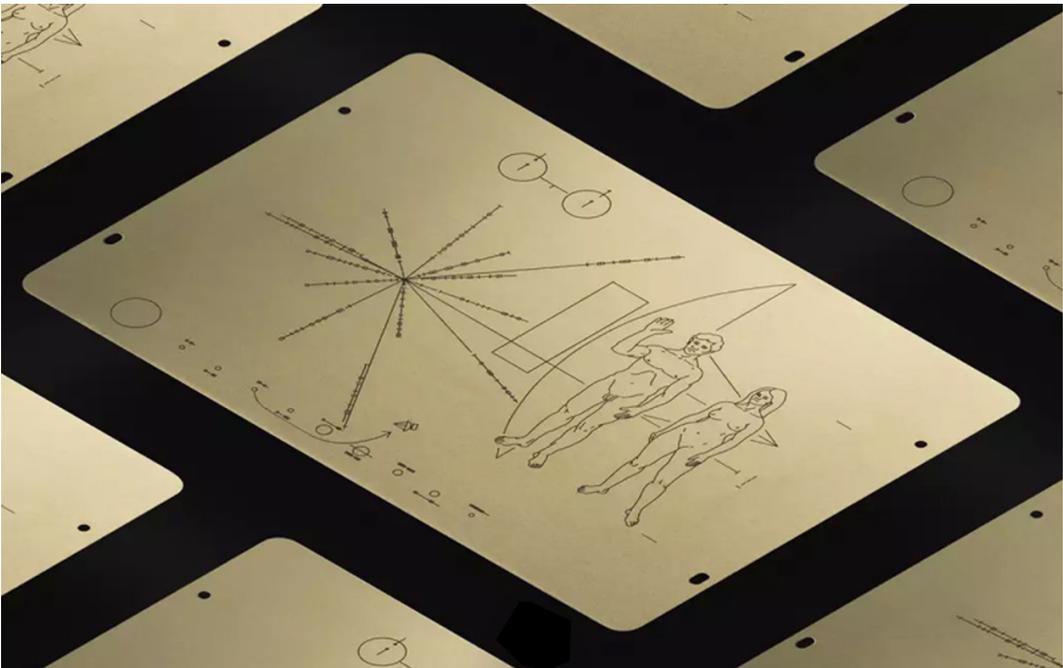
Although about forty years have passed (a span of time that is significant today in terms of technological innovation and marketing strategies), the power of this piece remains highly relevant. The television set, the “new window on the world”, has been replaced by the screens on our personal “devices”, the “new windows” that browse information through global online networks where, on the contrary, it would be rather surprising to find the image replaced by the written word. In this sense, the future of which Gombrich spoke has come true, making the image even more powerful and seductive to our eyes. The “Internet” today represents a true “new window on the world”, producing a non-stop temporal and spatial bombardment of images (no longer on paper or television), which accumulates in the intangible homes of smartphones and social networks.

The reason for which communication has been oriented towards a “medium” represented by visual images finds scientific support in several studies and a paradigmatic example in the plaque applied to the Pioneer F space probe, which NASA sent into space in 1972, trusting that alien species might also have a better understanding of a visual code (Figure 1).

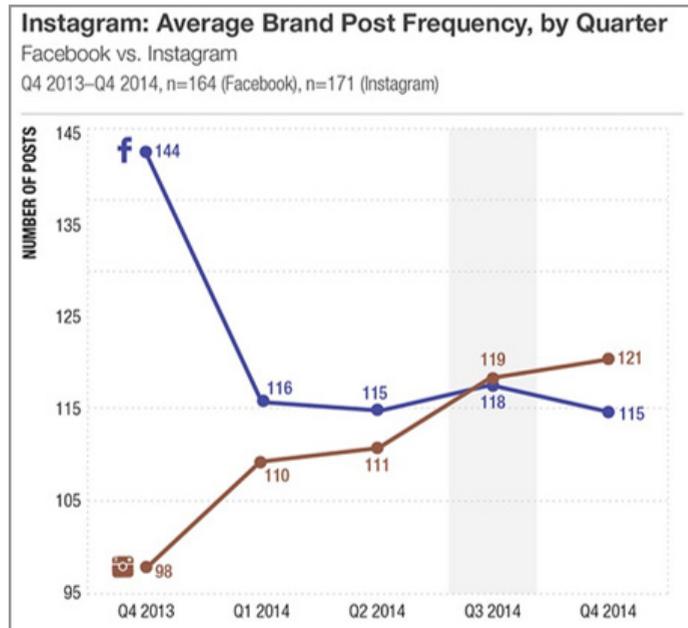
Already in *Ars poetica*, Horace compared the impact of oral and visual storytelling, affirming that “the spirit is stimulated more slowly by the ear than by the eye” (Gombrich, 1985, p. 158) while scientific studies on animal behavior, including those of ethologist Konrad Lorenz (1961, 1971) have shown that, in order to survive, animals (including the human species) are genetically programmed to react better to visual signals, and in fact Rudolf Arnheim, in his studies on visual perception, affirms that “motion is the strongest visual appeal to attention” (Arnheim, 1981, p. 303), in that motion is equivalent to a change in environmental conditions, with the approach of a danger or a desirable prey. On this basis, according to WJ Mitchell (1996, 1997) and, more recently, Raffaele Simone (2012), technology has intimately modified the “modus vivendi” of society, public and private spaces, so much so that living has taken on a new meaning today: no longer taking shelter in an architectural space but, through graphic interfaces and video-screens, connecting our nervous system to nearby electronic systems.

The massive and global representation of reality using visual images has inspired recent artistic installations, stimulating critical awareness. *Mémoires* by Roberto Pellegriuzzi

**Fig. 1** Plaque applied to the Pioneer F space probe and sent into space, 1972.



**Fig. 2** Histogram showing Instagram surpassing Facebook, 2014.



(2015) and *24 Hours in Photos* by Eric Kessels (2013) denounce this visual accumulation with magmatic contours. In the first performance, 275,000 photographs of every-day life (taken compulsively by the author until the digital camera became obsolete) were assembled in the form of a cloud to be immersed in. The photos represent a metaphor for the enormous quantity of images accumulated in our brain like in a cloud storage system. In the second, thousands of 10x15 cm prints of images uploaded to the “Flickr” social network in 24 hours filled a room up to the ceiling, making the intangible tangible (digital photos of emotions and memories) and showing that in contemporary society the intangible sharing of lived experiences on a social network is more important than the experiences themselves. This is confirmed by the rise of “Instagram” after 2014, to the detriment of “Facebook” (Figure 2): a social trend that increasingly prefers photos and videos to posts (i.e. the visual image to writing), immediately exploited in terms of new “social branding” strategies to achieve high levels of “engagement” among social network users (“followers”) and justified by the increasingly widespread awareness that “the image captures more attention than words” (M&CS Agency, 2019) or that “telling a story through a single photo is a strong

point” (Makia, 2017). According to Sara Trovato, a media expert and founder of Found, “The Instagramer represents the last frontier of the Influencer, whose great power lies in her ability to convey messages with a strong viral content through the use of the most common of media that everyone can understand: a photo” (Makia, 2017). A significant consequence of this trend, which favors the “social media of images”, is influencer marketing, the latest form of marketing based on the ability of some subjects (once defined as testimonials) to affect the purchasing power of others, using the social network and the visual image as communication channels.

“I WILL PRODUCE ART ON PAPER AND WOOD  
ACCORDING TO MY HEART, REGARDLESS  
OF ANY MARKET”

In the field of visual culture, the relationship between design and the reliance on market strategies, which affect creativity, has often been critically evaluated by graphic designers themselves. In particular, the issue was addressed for the first time in America where, after the second industrial revolution, graphic design was identified with advertising aimed at commercial sales. The designers, defined as commercial artists, were responsible for composing persuasive images to promote the company’s offer to the public. In this context, William Addison Dwiggins (1880-1956) supported free creative thinking, stating as follows: “My back is turned on the more banal kind of advertising [...]. I will produce art on paper and wood after my own heart with no heed to any market” (Heller, 2014, pp. 207-210). To construct the theoretical foundations of the discipline and redeem its autonomy, in the article “New Kind of Printing Calls for New Design” (1922) Dwiggins launched the term graphic design, which was taken up in 1927 by WG Raffe in the title of his book. Only after the Second World War was the term finally established internationally.

However, at present the connection between graphic design and induced culture is still an area of critical reflection

from an ethical point of view. In *Graphic Design for the 21st Century*, 45 contemporary designers were invited by Charlotte and Peter Fiell to express themselves on the relationships between graphic design, the business world and digital technologies. The most common response opposed the need for an ethical dimension to the proliferation of the commercial culture, which attributes forms of subconscious memorization to visual communication: “Today’s graphic designers must recognize that they have the responsibility and the ability to respond not only to the needs of customers, but also to those of the company. The persuasive power of graphic design could radically alter the point of view of people with respect to the themes of the future. Although not all graphic creations fall within the field of ethics, professionals in the sector must however tip the balance in favor of social rather than commercial commitment if they still want to represent an important and vital cultural force” (Fiell, 2005, pp. 10-11).

In Italy, graphic design for the purposes of information was theorized by Albe Steiner (1913-1974). A graphic designer, after 1963 Steiner linked his teaching profession to his Communist militancy at the “Advanced Course in Graphic Art” (CSAG) in Urbino (later ISIA), advancing an ideological position which held that the “graphic design trade” should make itself “useful” in seeking a common good to improve society. The term “grafica di pubblica utilità”, public service graphic design, was conceived in this sense, attracting designers in the 1970s and 80s towards visual communication at the service of public and/or political institutions, interested in involving citizens in the decisions regarding social, cultural, urban and health policies. An exemplary experience was the twenty-year collaboration between the municipal administration of Pesaro and graphic designer Massimo Dolcini (1945-2005), a student of Steiner’s between 1967 and 1969, who established a real “ethical dialogue” [Piazza 2009, p. 164]. This led in 1989 to the drafting of the Charter for the Graphic Design Project which in article 2 stated: “inasmuch as it can focus attention and operate perceptible distinctions, as well as confer a form and identity to the communications process, graphic design is helping to give substance to the structures of society” (AIAP, 1989).

With regard to visual language, the elements that characterized public service campaigns were aesthetic quality, clarity of communication, the absence of formalisms and social involvement. Albe Steiner, for example, looked to the work of El Lissitzky, the theoretical principles of Soviet and Bauhaus Constructivism as well as Italian geometric abstraction. The use of drawing was not a mere instrumental application but a structural and structuring value with its own theoretical foundations, which made it possible to act creatively in the of design thought process for the construction of meaning, and to graphically render the most appropriate visual configuration for communication. An understanding of the theoretical principles of drawing and of its geometrical-perceptive implications was a prerequisite for a conscious approach to a graphic design project. To achieve a correct correspondence between form and content, the development of the graphic design project required the use of visual concepts that indicated the most appropriate basic elements of the “grammar of seeing” to compose in syntax. The drawing classes at the Bauhaus and at the Ulm School (“Grund Kurs” and “Basic Design”) constituted a conceptual training preparatory to the Industrial design and Visual design courses, based on the premise that the success of a campaign did not depend on the idea alone but also on how the message was drawn.

The knowledge of drawing theories therefore became of fundamental importance to the development of the creative idea and the success of the visual message underlying the graphic design project. Mastery in the definition and relationship between point, line and surface; the innumerable perceptive and persuasive dimensions that relied on the use of color or black and white; the use of symmetrical or asymmetrical configurations (not only spatial but chromatic as well); the ability to allude to movement in the absence of animated technological innovation through static or dynamic perceptual effects; the relations of position and context between all these elements (both geometric and perceptual) constituted the theoretical foundations of the design process in the field of graphic design, to the extent that in the contemporary age Philippe Apeloing stated: “Our work is based mainly on ideas

**Fig. 3** Andrey Logvin, poster for the Universal Declaration of Human Rights, 2004.



and drawing has an important influence because it is capable of giving shape to cultural concepts and communicating them” (Fiell, 2005, p. 20). In this sense, an emblem of this position is the *NUL* (“Nessuno”) poster by Andrey Logvin, winner in 2004 of both the Special Prize at the IX International Triennial of Political Posters in Mons (Belgium) and the Golden Bee Award at the International Biennial of Graphic Design in Moscow. Designed at the request of the Ministry of Education in France, the poster graphically illustrates Article 5 of the Universal Declaration of Human Rights: “No one can be subjected to torture or cruel, inhuman or degrading treatment or punishment” (Figure 3).

“WE HAVE ALL THE POSSIBILITIES,  
BUT WE HAVE NO PLANS”

Just over forty years ago when digital graphics were still in their infancy, in the first chapter of a book dedicated to drawing applied to the graphic arts, the author Amedeo Grütter, recalling the work of the first typographers and printers, reviewed the professional identity of the graphic designer, highlighting how the latter, like painters and architects, relied on the laws of composition to arrange type and illustrations. Not coincidentally, the author noted the increasingly frequent use in Italy of the term “progettista grafico”, a translation of the English term graphic designer, introduced “to discourage the use of the unduly vague term “disegnatore” (n.d.t.: from “disegnare” - “to draw”) which, moreover, is unclear about whether it refers to design ideation, i.e. creative work, or to simple practical applications, i.e. mere mechanical action. The dualism of the English verbs to design, design-creation, and to draw, drawing-execution, makes the different meanings clear in this language, leaving [Italians] to search for a satisfactory terminology” (Grütter, 1979, p. 9).

In synthesis, the graphic design culture of the time claimed to assert the personality of the graphic designer as distinct from that of a simple executor of drawings, linking it to design, just as towards the end of the 1960s, in his book *Arte come mestiere*, Bruno Munari had discussed the term “Industrial Designer”, sustaining that the designer is “the artist of our age [...] because he addresses with humility and competence whatever the society he lives in demands of him” (Munari, 2005, p. 28). Whereas in the late 1970s, in his fundamental book *Il mestiere di grafico*, Albe Steiner clarified the professional identity of the graphic designer which, given his tendency to “dedicate his work to serial production”, was distinct from that of the printer and above all of the artist-painter (Steiner, 1978, pp. 128-129).

Twenty years later, in the aftermath of the widespread and increasingly accessible advent of digital graphics, the question of the identity of the graphic designer came back to the fore: at *Digital Culture* in Bellaria (2001), the interna-

tional graphic design, visual and multimedia communication magazine *LineaGrafica*, promoted a research campus to reflect on the new professional figures in visual communication in relation to the proliferation of increasingly powerful and seductive computer technologies for constructing images. The campus featured a discussion of the innovations brought by the rapid rise of computer technology in the field of graphic design as well as the mutation of the professional profile of the “graphic designer” into that of the “digital graphic designer” (Brunelli, 2001).

Over time, the digital dimension of graphic design has, without a shadow of a doubt, established new and different ways of representing graphic design, deeply involving every phase in the design development process: ideation, elaboration, visualization. The essence of digital graphic design has changed the logical-temporal process component, which has long accompanied the development of the traditional graphic design project. In fact, while the tools and techniques typical of traditional design have been replaced by the mouse, keyboard, video and, in general, computer drawing tools variously expressed in specialized software programmes, at the same time, the adoption of digital technologies has modified the traditional production process for the graphic design project in which the realization phase followed the concept phase. The digital speed which makes it possible to test and modify different hypotheses for the realization of the same idea in real time, has led to a greater integration between the phases of conception and realization of the project, so that the project is realized virtually while it is being developed. And while on the one hand this is the result of technological innovation, on the other it confirms the conceptual significance of drawing which uses codes, methods and techniques of representation to make the idea visible, and directly available for subsequent processing (Cervellini, 2016). Moreover, at the same time, the potential of computers to work with telematic networks makes it possible to design the graphic project “ex-novo”, but also to take advantage of a wealth of images and multimedia resources from which to draw inspiration.

Nevertheless, the very meaning of graphic design has

been further extended and with it, its areas of application. If, on the one hand, technological innovation has strengthened the technical-design capacity of graphic design, on the other it has introduced new fields of experimentation. Animation, multimedia, interactivity, immersiveness, “digital media” (both as tools to develop products and as means of mass communication), have contributed significantly to making the digital support an essential element in the process of developing the graphic design project starting with its most basic aspects, so that we might well agree with the following statement by Pier Pietro Brunelli: “if the digital language did not take the form of an effective visual representation, it would remain a field accessible to computer scientists and mathematicians alone” (Brunelli, 2001, p. 54).

The possibilities offered by technological innovation, however, lead to careful considerations on the need for a critical use of the digital tool to achieve the most appropriate configuration and implementation of the project. In fact, in light of the position that considers digital innovation to be the key to the quality of graphic design and image construction, many other voices have risen to state that it takes more than knowing how to use the most sophisticated digital visual image technologies to design and produce significant graphic design products because, if “good work is the product of creative intellect supported by sophisticated digital tools, it goes without saying that it takes more than technology to make a graphic designer” (Gordon, B. & M., 2002, p. 10).

In this sense, the cultural centrality of design confirms its decisive role. Moreover, the history of graphic design is marked by significant phases that, on several occasions, have confirmed the importance of the cultural value underlying graphic design thinking with respect to the evolution of the technical-technological factor alone. The advent of movable type printing, the introduction of photography, the creation of more modern reproduction and printing systems have led to an expansion of the meaning and roles of graphic design, which has stretched beyond the boundaries of publishing to spread into the fields of industrial production and mass visual communication. These phases

have always been accompanied by a fervid critical debate, focused on the subtle relationship between the technical product and the artistic product: just think of the contribution to graphic design by the Art Nouveau movement, by the artistic avant-gardes of the early twentieth century or the Bauhaus, whose experiments remain milestones in the history of graphic design for the attention they dedicate to the themes of balance between function, technique and aesthetic quality as well as the relationship between seriality and innovation.

In observance of these considerations and by virtue of the greater power and versatility of IT supports, the assumption remains that these resources actually do represent a resource of unquestionable technological value for the work of the graphic designer but, at the same time, they would be useless were they not supported by training and by design research into the ideational aspects founded on integrated cognitive horizons: “one thing I do - says Bob Gill - and that the computer doesn't, is think. The “layout” is no longer the imperative. We must think and do what the computer cannot do” (Newark, 2003, p. 116).

In this regard, the reflection by Lucio D'Amelia (2005) is significant: “It is no coincidence that we talk about foundational topics in a surreptitious but perceptible polemic against “do-it-yourself graphics” (with the new technologies we are all “amateur graphic designers”). The main intent is to bring graphic design back to its dimension as both an academic and professional discipline at the same time: academic (obviously not to be understood in a derogatory sense), because it delves its roots into an illustrious tradition that ranges from philosophy (visual thinking and ethics) to literature, poetry and figurative art (painting and drawing); professional, because it is related to a sector the products of which require rigorous technical application (for example, in industrial artefacts, printed works or hypermedia)”. In this sense, while basing his skills on digital input and from the point of view of someone who elaborates instances of design ideation, the graphic designer must be capable of consciously managing his role in compliance with a more general ob-

jective that views the graphic design project as an expressive synthesis between the latest image and media technologies, and research and knowledge. The “existential” aspect of the project remains fundamental. Referring to a quote by J.-P. Sartre, “we may have every possibility available to us, but we have no project” (Chia, 2008) if, as Philippe Starck also claimed, “matter, if not combined with the idea that gives everything meaning, is a phenomenon empty of content [...] Subversive, ethical, ecological, political, fun ... that’s how I see my duty as a designer” (Starck, 2018).

The cultural foundation underlying the education of a graphic designer must therefore promote a visual image design culture based on a trans-disciplinary education that firmly merges the graphic design skills from various interacting fields of knowledge, such as those belonging to the traditional “graphic design trade”, with semiotics, visual perception, the psychology of images and forms, the criteria of media and communication sciences, and has the capacity to work in a team with more specialized skills, including marketing.

The debate surrounding the role of graphic design, and the value of the image within it, is focused on these aspects, constantly assessing them against the needs of the business world and those of ethical consciousness. In this regard, it is useful to consider the positions of some graphic designers, published in the aforementioned *Graphic Design for the 21st Century* by Charlotte and Peter Fiell (2005), which represent the most advanced expression of this profession around the world and which, read one after the other, seem to arise from a single voice that in unison formulates a single critical thought: to make sense of the graphic image.

“The increasing use of graphic design as a purely commercial tool is devaluing its currency. The big design groups and big clients talk about “difference”, but in fact they mean sameness: everything looks the same. Design has been supplanted by marketing strategies, but no one ever says: “Look at that marketing strategy!” This means therefore that design is becoming visual “garbage”, and the result is monotony, uniformity and timidity. And paradoxically at a time when interest in visual culture is stronger than ever” Intro (Fiell, 2005, p. 104).

“There was a time when it was thought that design had an important role in society. It could tell people meaningful information or try to improve our ways of living. Today we seem to have forgotten that design has this possibility. The kind of work that designers seek are the ones for the coolest sports companies, not the ones that will have the most effect on society or add most to culture. It is time for designers to realize that design is not just something “cool” and that design is also not just about money. We need to take our profession seriously and engage in cultural and critical discussion about what we are doing and aiming for the modernist idea that designers are transparent messengers with no opinions of their own is no longer valid. We cannot just do our design and say issues such as unethical work practices are not our problem. We cannot say that a lack of meaningful content is not a problem. If we want the respect and attention we think we deserve, then we need to think about what happens to our work when it is seen in society and about the kind of work we want to participate in”, Jonathan Barnbrook (Fiell, 2005, p. 28).

“When I reflect on the themes and patterns inherent to the graphic design sector over the past ten years, the aggressiveness of the information superhighway, the blind enthusiasm for hardware and software, the propensity towards grandeur, the death of the avant-garde movements, the hunt for something new, the advent of Helvetica Neo-Modernism, the battle between vectors and bitmaps, the importance given to the brand, the complacent identity crisis of graphic design, I believe that my vision of the future of graphic design is rather paradoxical and romantic: I see a return to the classical virtues of the profession, to original ideas, creative imagination, craft techniques, individual aesthetics, historical compromise, social responsibility and critical attitudes”, Andrea Tinnes (Fiell, 2005, p. 176).

“Having come of age at a time when the computer was introduced and subsequently embraced as a radical new design tool and solution, I and other designers of my generation are seeing it now dominate almost every aspect of design. Design is fundamentally idea-oriented, and designers

carry profound influence in their power to shape and communicate cultural concepts. The future of design lies as much in this active and critical role within society as it does in the further development of technology. Graphic design is the art of visualizing ideas, activating space, intuiting proportion. It is the result of meticulous attention to detail. Good graphic design prompts the viewer to meditate, often unconsciously, on potent word/image combinations. Good graphic design is always memorable”, Philippe Apeloig (Fiell, 2005, p. 20).

“The design that interests me most is what reaches the heart of the viewer. We are surrounded by professional and masterfully executed graphic creations, beautifully illustrated with exceptional photographs, yet almost all of them seem to me (to me and I believe to many other people too) cold. They are simply floppy: well produced, frivolous, absolutely limp. There is no emotion or reflection, some information yes, but always limp. I think this is mainly due to the fact that most designers don’t believe in anything. We are not interested in politics or religion, we do not take sides in important matters. If you have such a weak conscience, how can you produce a strong creation? There are films that moved me, books that changed my way of seeing things and music that made me change my mood. Our goal for the future will be to reach people’s hearts through design”, Stefan Sagmeister (Fiell, 2005, p. 156).

“My long-term goal is to achieve a healthy balance between a strategically designed design, which does not pollute the environment, and a creative design that seeks to broaden traditional patterns, be they aesthetic or concern the choice of means. I would like to use the tools I have as a draftsman to assume social responsibilities, because I am aware of the fact that the designers of my generation have filled the streets with omnipotent and meaningless creations”, Aboud Sodano (Fiell, 2005, p. 12).

“Graphic design can control language and also shape our visual urban environment. It is for this reason that I believe we should not allow it to be thrown together in its conceptual creation”, Peter Anderson (Fiell, 2005, p. 16).

## CONCLUSIONS

If on the one hand one cannot but agree on the proliferation of an increasingly persuasive use of the visual image as a means of direct and immediate communication, on the other it is true that there is an awareness and a critical resilience towards this phenomenon on the part of an influential professional and academic world of graphic designers. It therefore becomes important in educational curricula to offer our young people a wide cultural panorama, based on the history of graphic design and on the theoretical foundations of graphic design for the construction of images, drawing attention in particular to the danger posed by the persuasive power of the image when it finds widespread dissemination through strongly mass-oriented communication contexts, such as the current channels of the web and social networks (Zerlenga, 2007; Falcidieno, 2008; Cicalò, 2019, p. 29; Unali, p. 175).

Obviously, it is important to state that the persuasive use of the image concerns and, above all, has concerned various fields of communication, sometimes through multiple channels, as demonstrated in several contributions to the recent international and interdisciplinary conference on images and the imagination held in Alghero (2019): from political propaganda (Vattano, 2019, p. 143) to terrorism (Oppedisano, 2019, p. 157). The challenge must therefore be addressed within the field of education and belongs, as Sergio Polano states, to this era of “excess and dispersion, acceleration of time and contraction of space, loss of “frames” we once used to encase knowledge and practices” (Polano, 2002, p. 48). To resort to questions of meaning when designing images will mean looking towards a different future, in which intellectual and ethical honesty might have blurred contours at the moment because, as Bob and Maggie Gordon state in the introduction to their publication entitled *Digital Graphics*, an ancient proverb says: “if we can see into the future it means that we are not looking far enough” (Gordon, 2002, p. 9).

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# INTENSIFYING OUR GAZE IN ORDER TO EXPAND OUR ACTION, REFLECTION, AND PARTICIPATION

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## ESSAY 27/01

HERITAGE  
IMAGES  
EDUCATION  
DIDACTICS  
RESEARCH

In this paper, I offer preliminary reflections on selected research pathways involving cultural heritage, the general public, and actions connecting the two. Exploring what directions this line of inquiry might take going forward, what its underlying epistemological implications might be, and what methodological

choices it might entail – such as the need for contamination among disciplines – is pivotal to my discussion. Specifically, I focus on the main procedural steps in these research programmes, from design and launch through implementation and wind-up, in terms of both immediate outcomes and potential or actual spin-off projects.

## INTRODUCTION

In this brief paper, I set out to analyse, albeit not as systematically as would be ideal, a series of recent projects and studies that I have conducted with different action and research teams. This work has been carried out in a field with fluid boundaries, which spans art, museum studies, heritage education, pedagogy, and didactics. A space of contamination in which multiple cultural and social forces have interacted, particularly collective actors such as schools, museums, and heritage sites that engaged with and learnt from one another in the context of our research programmes.

The individuals and groups that were invited to play an active part – and sometimes complementary roles – in the various projects included: children, adolescents, youth, adults, and older adults. To be clear, none of these parties were classified by the researchers as mere consumers of cultural experiences, but were viewed from a more complex perspective that embraced their total presence and not only their professional or social roles, and acknowledged them as the main actors in the project from the first moment of their involvement. Furthermore, the present brief account not only serves to communicate a body of research experience and findings to the broader scientific community, but also represents a means for me – as one of the researchers directly involved in these projects – to clarify my own pedagogical and metacognitive reflection (Albanese et al., 2002) about what actually took place during them or is still taking place. Writing the present paper has thus meant constructing a deeper and more complex perspective on our action programme and drawing connections between different research projects to identify a broad line of inquiry rather than a univocal set of outcomes (Demetrio, 2013; Mortari, 2015; Schön, 1983, 1987). Similarly, there is scope for this new journal, as it sets out in its first issue to create and define a new space, to accomplish a set of fundamental tasks: first, to disseminate and sustain completed and ongoing research in the domain of images

and the imaginary; second, to create and multiply unconventional and unthought-unthinkable networks that disciplinary divisions typically render improbable or impossible; and finally, to identify future prospects and directions, within a forward-looking perspective that is not linear but multi-faceted and contemporary.

#### REFLECTING ON THE STANCE OF THE RESEARCHER

As the title suggests, this paper is intended to “intensify our gaze”, not only upon actions undertaken to engage audiences with heritage assets, but also on the figure of researcher him or herself. This may be attempted by engaging in a deeper level of reflection on the various steps in the individual projects – such as the research design processes brought to bear, the actions undertaken, the data analysis and debriefing stages – even some time after the project has ended, with a gaze that zooms out from specific details to seek a more detached perspective and identify connections that can be surprisingly different to those routinely experienced during project implementation. Indeed, our immediate reflection on what we have just implemented directly in the field often remains too close to the ground, with our gaze almost exclusively trained on research objectives and outcomes that are sometimes virtually preordained. In contrast, I advocate here for an alternative way of looking at our research work that is potentially more critical and penetrating, but certainly interdisciplinary, and capable of dialogue and exchange with other fields. The stance to be aimed for is one of detachment, a kind of *epoché*, that enables us to revisit, to more mindfully observe – with the input of others – the flow of actions that has taken shape in the course of the experimental projects implemented and to read the overall direction this flow is taking, which in part has been consciously planned, and in part has unfolded independently of what was originally imagined. Specifically in relation to educational action,

when reflecting on a proposed educational offering, it is crucial to take into account what Luigina Mortari has described as: “The highly problematic nature of educational practice [...] which is due to the fact that it often features unique cases, each different from the other, for which no predefined lines of action are available.” (Mortari, 2015, p. 9). This demands reflecting attentively on and constantly monitoring what has been done to date.

#### TWO RESEARCH PROJECTS: IN A MUSEUM AND AT A HERITAGE SITE

In light of the aims we have just briefly outlined, let us now focus on salient research projects, selected from among those presented and published at the 2017 conference and accepted for presentation at the 2019 conference. I have chosen to examine research projects in this field because they are in keeping with a perspective from which images, imagination and interdisciplinarity are all viewed as essential. Two projects in particular – given their themes, mode of implementation, and outcomes in terms of reflection – lend themselves to a perspective based on: gaze, action, reflection and participation, all key words that are cited in the title of this paper and that serve to delineate the perspective informing it. The first, “Images of a Museum. Participatory and Educational Pathways branching out from a Heritage Asset. The Ettore Guatelli Museum as a Case Study” (Mancino et al., 2017) concerns heritage assets in a museum setting, the Museo Ettore Guatelli, which has abandoned an exclusively consumption-based perspective in favour of the dynamics of interpretation, by actively seeking to foster contamination between present and past, among different disciplines, and among diverse audiences (children, educators, teachers, artists, visitors) who are invited to adopt an authorial stance (Zuccoli, 2017). The second “Rethinking local heritage through graphics in Mantua and Sabbioneta. Images, maps,

fanzines for narrating a Unesco site with students during school-work internship” (Zuccoli et al., 2019) is a project that focused on landscapes and cultural heritage more broadly, seeking ways to stimulate interpretation and participation, with a view to establishing new, or rekindling old, ties with the cities of Mantua and Sabbioneta, a single Unesco World Heritage site. In both of these research projects, the key concept was to foster direct participation, leading audiences to rediscover or form a bond with the heritage asset, stimulating the acquisition of multiple forms of knowledge no longer solely by means of logically reasoned communications with a high level of information content, selected a priori by “experts”, but by promoting awareness, discovery and innovative ideas. For each of the two projects, let us home in on key phases that proved critical to ensuring the satisfactory functioning of both the research and action dimensions. The first crucial point is that the project should be designed in collaboration with representatives of the participating institutions, such as museums, local authorities, etc.: this implies first getting to know these parties, exchanging information with them, and discussing the project aims with them, with a view to formulating a tentative project plan based on the needs of the heritage site. A second requirement that arises as the project unfolds is spending time at the sites themselves, so as to develop a more in-depth and meaningful knowledge of them from an individual perspective and based on dialogue between specific professional perspectives. For example, the second project on Mantua and Sabbioneta, thanks to funding from the Lombardy Region, drew on the expertise of six different professional figures: a geographer, an education specialist with a specific interest in collecting stories, an artist, two art historians, and a film director. This investment was designed to ensure that the project would produce plural and interrelated outcomes. A third phase, which is not necessarily consecutive to the others because it is often initiated at the outset of the project, involves remaining in contact with the local community, by participating in targeted cultural or ev-

eryday life events. A variety of instruments (questionnaires, video interviews, maps, photographs, three-dimensional objects,...) may be used to collect opinions and information. The result is that the researcher becomes a member of the local community for the duration of the research. In our own projects, presenting images and inviting audiences to create images was an indispensable element of the research strategy, serving to revive memories and stimulate ideas of greater depth and richness than when only the verbal channel of communication is used (Bruner, 1988; Gardner, 1983)

#### LET US REFLECT ON OUR ... GAZE

Why do we need to intensify our gaze as suggested in the title of the paper? First, our own gaze as researchers: as we deeply engage with heritage and its consumers and custodians, we should cultivate an alternative approach to looking and looking at ourselves, so as to interact with others and move beyond disciplinary boundaries that restrict us to a single perspective. But, most importantly, the gaze of the local community, audiences, tourists, and those with responsibility for the heritage assets: The research projects discussed here were designed to orient all these parties' gaze away from serial accumulation and an overwhelming emphasis on quantity, inducing them to seek enhanced quality via a process of rarefaction. This implies an alternative way of seeing, which can be facilitated by translating what we see into signs: Jacques Derrida suggested that the act of drawing makes us blind to what we are seeing, yet enables greater depth of vision: "The drawing is blind, if not the draftsman or the draftsman. As such, and in the moment proper to it, the operation of drawing would have something to do with blindness [...] He [the draftsman] invents drawing. [...] Blindness pierces through, right at that point, and thereby gains in potential, in potency: the angle of a sight that is threatened or promised, lost or restored. (Derrida, 2003, pp. 12-13)

In our projects, the active use of photography, participants' musings and stories about maps, their choice of detail, and the drawings presented to and created by them, stimulated a curious, penetrating, innovative and sometimes irreverent, gaze. A gaze that regains depth (Berger, 1972, 2003), and that chooses where to linger, questioning the predefined choices of a hectic lifestyle, imposed forms of tourism, and a simplistic view of reality and cultural heritage. A concept of seeing that resonates with the "active exploration" advocated by Rudolf Arnheim (2005, p. 55).

#### LET US REFLECT ON... ACTION-EXPERIENCE

The projects that we conducted with local communities and audiences/visitors at the participating heritage sites, were informed by a strongly educational and didactic perspective. Indeed, education specialists, curators and artists in the museums and heritage sector have long emphasised the need for concrete steps to foster direct participation (Sennet, 2008) and to engage audiences in activities that require more than simply listening. However, there is always the risk – as John Dewey long since warned in relation to the school setting – that our good intentions will lead us to devise a set of pleasant activities that fill in time but are repetitive and detached from authentic content and its complexity. This would make us guilty of reductionism as opposed to simplification. Dewey defined the concept of experience, a crucial prerequisite to designing experience: "The meaning of "experience". [...] the term experience may be interpreted either with reference to the empirical or the experimental attitude of mind. Experience is not a rigid and closed thing; it is vital and hence growing. [...] But experience also includes the reflection that sets us free from the limiting influence of sense, appetite, and tradition" (Dewey, 1961, p.292). What kind of experience should we therefore seek according to Dewey: "It is not enough to insist upon the necessity of experience,

nor even of activity in experience. Everything depends upon the quality of the experience which is had. The quality of any experience has two aspects. There is an immediate aspect of agreeableness or disagreeableness, and there is its influence upon later experiences. [...] The effect of an experience is not borne on its face. [...] Hence the central problem of an education based upon experience is to select the kind of present experiences that live fruitfully and creatively in subsequent experiences..." (Dewey, 1953, pp.15-16)

On this point, Yves Chevallard's theory of didactic transposition, albeit specific to the field of teaching, may be salient to us, especially the notion that learning content is adaptively transformed from an object of knowledge to be taught into an object of knowledge that has been taught (Chevallard, 1991, p.39); hence the need for epistemological vigilance over the value and accuracy of the learning contents we propose to audiences (Nigris et al., 2016).

#### LET US OPEN UP TO ... PARTICIPATION AND SHARED REFLECTION

The arguments presented to date have set the stage for exploring the crucial theme of participation, defined as sharing a meaningful experience with others while being open to the potential changes that this may bring about. Here, it is of interest to cite Liliana Moro, whose works of art are currently on display in the Italy Pavilion of the Venice Biennale, on the underlying significance of cultural heritage events: "Sharing an experience means sharing a space and a time, but also and most especially share one's everyday thinking and acting with others. Public space is constructed through dialogue and 'doing [things] together'. Public space/time is nothing other than thinking about what we do"(Flash Art, 9 May 2019). Moro juxtaposes this statement with the words of Hannah Arendt in "Between Past and Future": "Are we truly free? It is impossible to communicate the value of the

freedom to act in a world that does not see public action as meaningful". (Arendt, 1991, p. X). Hence, our action needs to become public; this means engaging with our real-life settings, while also fulfilling a political function, in the sense of rethinking and redesigning community spaces and actions. A final source of inspiration is offered by the MAXXI exhibition "La strada. Dove si crea il mondo": the road, taken in its metaphorical sense, may be viewed as the place-paradigm where we conduct our research. "If the city is a living body, its streets are the arteries along which blood and energy are regenerated and circulate. Displacements, encounters, and relationships among people are essential to keeping the city alive. Awareness of this is even more vital in our own time, the era of global digital communications in which the virtual world tends to replace a large portion of the real world". (Hanru, 2018, pp.14-15). In the domain of cultural heritage, the virtual world can actually be of great support to us, bearing a potential that we could only dream of until a few years ago (Zuccoli, & De Nicola, 2019), although it needs to be securely anchored to our material presence in places and collective spaces.

## CONCLUSIONS

In this paper, I have attempted, albeit not systematically enough, to explore selected aspects of a body of cultural heritage research and action projects. Attention to gaze, encounter, participation and reflection have undoubtedly been the cornerstones of many of these pathways. A reflective stance on the part of the researcher is crucially important if we are to identify and pursue multifaceted and interdisciplinary lines of debate and inquiry: where such reflection may take place and the forms that it may take are questions that have yet to be fully explored.

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