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Multidisciplinary Aspects of Design

Objects, Processes, Experiences and Narratives

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Contents

NARRATIVES. Critical Approach, Languages, Explorations

Accessible Experiences. Designing Synaesthetic Access to Culture

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Abstract. The experiences produced using environments, physical or cultural objects, change significantly in relation to the characteristics of the users, their skills and limits, as well as change in relation to the aesthetic preferences and the context of use, chosen according to the effectiveness and/or enjoyment of use.

This text intends to address the issue of accessibility to a cultural asset in a museum context [12, 13], to highlight how designing a variety of experiential ways, of experiences based on different sensory registers, leads to broadening its accessibility also to users who, by necessity or by choice, they require specific conditions of use.

The paper highlights and exemplifies – taking conventional cases and experiments conducted in the teaching of communication design – synaesthetic translations from the visual/figural to the auditory/verbal, and from the visual to the tactile applied to communicative artifacts, highlighting how the concept of translation – between sensory registers, between devices, between graphic formats – is the foundation of every experience that intends to be accessible.

Keywords: Accessibility · Synesthesia · Audiovisual Translation · Museum · Communication design

1 Accessible Experiences

This text intends to bring attention to the accessible sensory project intended both as a project that can be used by all people and as an opportunity to foster and experiment with unusual user experiences and ways of use that can respond to new needs.

Experiences aimed at people with different perceptual or motor characteristics and abilities, to respond – consistently with the design for all project philosophy – to human diversity, and not to a standard person.

I pursue this objective in the belief that the "effort" to make accessible – the reference is to accessibility to contents and more generally to cultural heritage – is not to be understood as a limit to creativity and possible design solutions, but rather an opportunity to offer extended, expanded, diversified user experiences, achievable in different personal and contextual conditions.

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1.1 Concept of Accessibility

The concept of accessibility, understood as the reachability and usability of spaces, places, architectures, is a recent concept in the project, certainly not a fundamental factor in ancient cultures and societies [1], when security and defense were priority of the territory from the enemy. Even later, in Humanism, although man is placed at the center, accessibility is not yet considered, the reference is an ideal man/woman. I remember the "Vitruvian Man" designed by Leonardo, who becomes a symbol and reference for architecture on a human scale; up to modern architecture with Le Corbusier's *Modulor* (vol. 1/1948, vol. 2/1955) – a scale of proportions – referring to an ideal man, not "real"; and the following manuals, on which I also trained as an architect at the end of the 1980s, refers to an "average man", with standardized measurements. Referring to the average man, however, means referring to a minimal number of people, because most of us are above or below this average size, and have specific characteristics that differentiate him.

As Lucia Martincigh [1] – of the Observatory on Accessibility of the Order of Architects of Rome – points out, in modern times we have gone from designing for standard users (abstract, ideal for a few); to a tailor-made design (specific for people with disabilities); up to the current phase in which the design is aimed at an extended user, in the belief that if a space, an object, an information is usable and usable by people who have difficulty, all the more reason it will facilitate its use by all. Each of us, in certain circumstances, periods of life, in illness, in old age, has physical and/or perceptual limits [2], or encounters impediments to access due – in addition to physical and perceptual barriers – to the geographical or territorial context. Linguistic and cultural differences can also become a barrier that hinders the comprehensibility of a content. An accessible project is therefore more easily usable by everyone, regardless of disabilities and personal conditions. The words that are used to define the current approach to design, architecture, object design, services, communications, are different:

- *Universal Design* (1985, American Approach)
- *Design for all* (1995/2004, European Approach)
- *Accessible Design* (2001, Swiss Approach)
- *Inclusive Design* (2005, British Approach).

All terms that, although with geographical origins, are different in any case aimed at increasing the accessibility of interactive systems, products, spaces.

It is not easy to specify what differentiates these approaches, there is little international consensus on the use and concept of accessibility in design, and this paradoxically risks bringing the public and the user less overall accessibility since sharing the concept means also make it more easily measurable, evaluable, and therefore understand how effective a solution is [2].

In a note of the *ISO Guide 71/2001* it is specified that these terms are used in a similar way, but in different contexts. By comparing the different approaches and the types of artefacts to which they are addressed, the expression *Accessible Design*, with the requisites required in normatives and guidelines referred to it – from the *Web Content Accessibility Guidelines* (1999/2021), to the Stanca Law 9.01.2004, first Italian law on accessibility to digital content, up to the aforementioned ISO Guide (2001/2014) – places more attention than others on sensory aspects, their limits and how to promote better

perceptibility of information. This makes it particularly applicable to communication design artifacts that are artifacts to be seen, heard, touched. They are books, they are videos, they are interfaces, they are packaging. Therefore, it is to it that I will refer in the following.

1.2 In/Accessible Content

In the specific of communication design, a content can be inaccessible for several reasons, even trivial ones, for example:

1. it is inaccessible when the information does not reach the recipient, who ignores its existence because it is not present in the media that he usually consults (*information level*);
2. it is inaccessible when the recipient fails to understand the information, due to its level of complexity, for linguistic reasons if it is written in a language unknown to him (*cognitive level or inter-linguistic level*);
3. it is inaccessible when there are perceptive barriers, due to the person's characteristics, or situational, caused eg. the lighting or noise conditions of a given environment (*sensory/perceptual level*).

Considering this last level – therefore sensory accessibility – in a specific context, that of Museums, the latest Istat Report on Italian Museums, published in December 2019, just before the Covid19 pandemic, returned the following data: 53% of the museums are equipped for physical accessibility, with ramps, elevators, etc. useful for people with motor disabilities; while only 12% of the museum structures have alternative modes of use to the visual, providing «tactile paths and information materials for the visually impaired and blind» (Engl. tr. From: Istat, 2018).

2 Designing Accessibility: Normatives and Guidelines

These data, as well as others relating to content – the reference is to the limited availability of books in accessible formats (audiobooks, Braille books, or accessible ebooks) – highlight a great need for accessible design in communication design which, in the future very close, will have to enter the competencies of designers, even if only to comply with normatives and guidelines [14].

I indicate below some recent normatives and standards of particular importance for designers.

Web Content Accessibility Guidelines (WCAG) (1999–2021). Web accessibility guidelines based on four principles, require web content to be: *Perceivable*, *Operable*, *Understandable* and *Robust*. To which in the draft version 2.2. (2021) the requirement *Conformance* with the normatives has been added. These guidelines are important for graphic designers especially in the indications relating to perceptibility, here we find indications on color contrast, on the use of images, on text spacing. Also, for audiovisual design, indications for the preparation of subtitles and audio description [https://www.w3.org/].

ISO Guide 71/2001 (2014): *Guidelines for standards developers to address the needs of older persons and persons with disabilities.* A Guide aimed at defining the accessibility requirements and recommendations for products, services and built environments. Seven tables are attached to the first edition, three of which are useful to the communication designer, relating to information standards (labels, instructions for use, warnings), packaging and user interfaces. Each table considers the following aspects: sensory (seeing, hearing, touch, tasted/smell, balance), physical, cognitive, allergy. [https://www.iso.org].

PEBA (2018). The plan of the Italian Ministry for Cultural Heritage and Activities, presents very detailed guidelines for overcoming barriers in museums and archaeological parks. Architectural barriers, but also sense-perceptual, cultural, and cognitive, which concern all possible contexts of accessibility design: from the building to the website. It also provides for the establishment of the figure of the "Responsible for accessibility" in museums, a technical professionalism that supports the Director of the museum in setting up paths and communication tools accessible to an extended audience [http://musei.beniculturali.it].

Marrakesh Treaty (EU Directive 2017). The implementation decree in Italy dates back to 2020. It provides for exceptions or limitations to copyright to reproduce and disseminate copies, in accessible formats (such as Braille books, e-books, audio books or large print, aimed at people who are blind, visually impaired, or otherwise print disabled [https://eur-lex.europa.eu]. It therefore concerns the entire chain of the publishing project.

European Accessibility Act (2019). (2019/882 of 17 April 2019, published in the Official Gazette on 7.6.2019). European directive that must be applied to all products and services on the market starting from June 28, 2025. It has as its reference the previous UN convention on the rights of people with disabilities (13.12.2006). In particular, in Annex I of the Directive, "Accessibility Requirements for Products and Services", important information is indicated for designers. Among these, the following three are relevant for communication designers:

1. the information must be presented in an *understandable* way;
2. the information must be presented in a *perceptible* way;
3. the information must be made available through *more than one sensory channel* [https://ec.europa.eu].

In short, a cultural asset is accessible if it is also *understandable*, *perceptible*, *multisensory*.

3 Audiovisual Communication Accessibility

In this context, and to meet accessibility requirements, we are trying to sensitize students to communicative accessibility, to make them become aware of the problems that limit accessibility and to consider the *accessible design* as an opportunity to experiment with new user experiences.

In particular, the artifacts we deal with are motion graphics videos, to pursue a synesthetic congruence between visual information – the typography and the images – and auditory – speech, sounds and music – and to verify the interchangeability on the different sensory/communicative registers. We experiment on the translation of the contents between the different sensory registers, so that one can become the vicar of the other.

This highlights the close relationship that *accessibility* has with *synaesthesia.*

We aim to go beyond accessibility designed to comply with the normatives, to offer a diversification of experiences, of the ways of enjoying content, regardless of the presence of disabilities: I might prefer to listen to a book instead of reading it, or to watch a video without audio, so as not to disturb those sitting next to me.

3.1 Audiovisual Analysis: Masking Method

How to get to an accessible audiovisual project? In our working group we began to tackle the issue of accessibility by following degree and PhD theses [11], the first of these dates to twenty years ago, in 2001, applied to museum accessibility [3, 4].

We then brought the theme into teaching, and the first question we asked ourselves was to overturn the assumption: how to make people understand the *inaccessibility* of an audio-video content. We considered effective the methods already used in film analysis, and in particular Michel Chion's *method of masking* [5], a method of observation – called *audiovision* by Chion – which consists in alternately masking one of the sensory registers, to be able to answer the following questions: What do I see of what I hear? What do I feel about what I see?

This is to demonstrate: «the reality of audiovisual combination – that one perception influences the other and transforms it. We never see the same thing when we also hear; we don't hear the same thing when we see as well» [5, XXI].

We proposed audiovisual exercises to students, both with the students' own works and with authored video products. One exercise consisted in proposing listening to a film in the dark, audio only, removing the video, concurrently asking students to fill in a questionnaire, in which to describe the mental image induced by listening, specifying how much the audio-only narration had been understandable.

The descriptions collected concern the visual characteristics of the environments, indicate the colors, the clothing of the protagonists, descriptions that, in an audiovisual verification, also find singular correspondences [6]. In general, the data collected indicate a fairly good level of understanding of the narration (declared), despite the obvious difficulty of the task due to the use of listening only, a modality in which we are not trained.

Starting from the year 2016/17, we have approached the analysis of audiovision with propositive activities, aimed at the design of accessible audio-videos, based on three consolidated techniques – audio description, subtitling, tactile translations – nevertheless trying to experiment design solutions aimed at everyone, ie not distinguished by disability. So, a single product of which I can have a different user experience. Usually this is not the case because, specifically for the audio description, this is aimed only at the person with visual impairment.

Audiodescribe. It means providing a voiceover that is added to the original audio – therefore to voices, noises, and music – to describe what is happening on the screen. We know a complex task, it is difficult not only because the possible descriptions (of a scene, of the characters, of their actions) are multiple, and may or may not be capable of suggesting visual mental images; but also, because things can be seen differently. Any description passes preliminarily for an observation, for the reading and visual exploration that is made by another subject, who is different from the user.

Subtitle. Technically perhaps simpler than the audio description – many platforms, first YouTube, provide automatic subtitles – but the "subtitle", let's call it standard – both automatic and live – also poses perceptual difficulties. In particular the subtitle:

1. diverts attention from the scene, as it modifies the hierarchies of the composition;
2. exclusively translates the semantic aspects, leaving out the expressive ones of language, intonation, emotion produced by speech and music;
3. appears as an additional and not integrated element to the project.

Studies that use ocular tracings detect the reading paths of the elements on the screen, the fixation times, and show that the subtitles take away attention to the subject of the scene [7]. Therefore, the design goal we are proposing is to integrate the *subtitle* with the *title* or to understand it as an integral, and not an additional, part of the typographic project, working on the typographical translation of speech.

We use the term "translation", and not simple "transcription", because what we try to do is to translate not only the semantic aspect, but also the expressiveness, the intonation of the spoken word, we try to translate the rhythm of the music, considering every sound aspect.

Tactile Translations. They are tactile translations of visual and figural elements of the audio-video project, usable in the contexts of use in presence, such as an exhibition, a presentation in the library, an event. These translations can use different techniques, which can also be achieved in short-run print [8], among the techniques we most commonly use are UV varnish and 3D prints. The effectiveness of each solution then requires a verification phase, which the designer can do first of all on himself, by applying again the analysis tools that obscure the visual, and subsequently by the preparation of a test phase with users (Fig. 1).

(a)

(b)

Fig. 1. *Controsenso* exhibition. Above: tactile map detail. Below: tactile QR code for accessing videos. The communicative artefacts of the exhibition were designed with accessibility and Braille writing criteria. Embossed printing with UV varnish. Design: SavLab (www.sinestesie.it/controsenso).

4 A Case Study: Controsenso Exhibition

ControSenso is a small educational exhibition – set up at the Istituto dei ciechi in Milan in conjunction with the "Accessibility Days 2022" event (https://accessibilitydays.it/2022/it/) in May 2022, patronized by the School of design and by the Department of the Politecnico di Milano – which well exemplifies the relationship between synaesthesia and

accessibility, and in particular exemplifies how the same content can be translated into multiple sensory registers by pursuing a synesthetic consistency in the communication process.

The exhibition brings together the projects carried out by the students in our teaching (professors: G. L. Balzerano and D. Riccò, collaborators: A. Barone, A. Gonzalez, G. Martimucci, A. Zamperini), in the master's degree course in Design of communication to the Politecnico di Milano.

The teaching activities were dedicated to the audiovisual accessibility of the work of art in the museum context. Each group of students has chosen a museum, an artwork, or a collection of works, present among the collections of the city of Milan (Italy), on which to create an audio-video project with the communicative purpose of inviting participation and visit to the museum space, anticipating the sensory involvement and emotions of the visit.

Each video was designed respecting the accessibility requirements, integrating subtitles and audio description, moreover – considering that the project was aimed at an exhibition event – material artifacts were also created that can be explored tactfully and olfactively.

The project was given scientific support by Rai pubblica utilità (the company that is the exclusive concessionaire of the public radio and television service in Italy), the Institute of the blind in Milan, with which the Department of Design has a scientific collaboration and the organizers of the Accessibility Days event.

The title given to the exhibition – *ControSenso* – encompasses the contradiction of the sensory barriers with which we face every day and at the same time summarizes and suggests the possibilities of sensory substitution, in the play on words "SensoControSenso" (sense against sense), in which a sense can stand in the place of another, not to replace him but to become vicar, to suggest an alternative way.

Overall, nine accessible multimedia projects, video and material projects were exhibited (examples of videos and tactile translations in www.sinestesie.it/controsenso).

In this specific case, the exhibition event was designed both in its experiential value and as a designed accessibility verification tool, applied to an extended audience including people with visual and hearing impairments.

5 Conclusions

Verifying the synaesthetic nature of a project is one of the tasks that the designer who pays attention to accessibility must propose himself and goes through tests and experiments aimed at evaluating the intersubjectivity of the relationships established to overcome individual aesthetics.

As we already wrote [9] all the transformations of a *prototext* (i.e. an original text) into a *metatext* (i.e. a translated text, according to Popovič's meaning) that use verbal or non-verbal signs of different sensory registers, if they can be defined as "translations" from one to the other, and therefore pursue the equivalence/congruence of a content in another expressive form, they can also be defined as synaesthetics.

In the translation process that involves contents and configurations offered on multiple sensory registers, the recognisability of the same content used in different ways is

already in itself an indication of the synaesthetic nature of the project, i.e. the identification of shapes, colors, structures, textures in the translated sensory modality, sounds, means recognizing – between the original text and the translated text – analogies, remainders, relationships. As Tullio Gregory [10] stated:

«Il tradurre è fondamentale nel passaggio da una cultura all'altra. E non solo tradurre testi, ma trasferire esperienze, miti, valori, modelli. La storia della civiltà è sempre un tradurre, per rendere accessibili testi che altrimenti rimarrebbero ignoti» [«Translation is fundamental in the transition from one culture to another. And not just translating texts, but transferring experiences, myths, values, models. The history of civilization is always a translation, to make accessible texts that otherwise would remain unknown»].

We therefore place the processes of synaesthetic translation at the foundation of any experience that intends to be accessible to all.

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