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Digital Age in Semiotics & Communication

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Digital Age in Semiotics & Communication, a journal from the Southeast European Center for Semiotic Studies at the New Bulgarian University and founded by Prof. Kristian Bankov, explores the new forms of knowledge, social and linguistic interaction, and cultural phenomena generated by the advent of the Internet.
A topic is chosen for each issue by the editorial board, but the topics will be always related to the issues of the digital environment. The topic is announced with a call for papers and will also be available on our Facebook page (facebook.com/DigitASCjournal).
The working language of the journal is English. It uses double-blind review, meaning that both the reviewer's and the author's identities are concealed from each other throughout the review process.

Periodicity
The journal will be published annually by the Southeast European Center for Semiotic Studies and the New Bulgarian University Publishing House.

Purpose
The purpose of the journal is to provide a collaborative work field for scholars interested in researching new phenomena in the dynamic digital world. Our main purpose is to build a scientific bridge between the fields of semiotics, communications, social sciences and the problems of the digital era. We believe that our collaborations can raise the level of understanding for modern digital phenomena, providing both a solid theoretical framework and profound applied research.
The pilot issue summarizes the whole research program of the Center and the journal in particular. It is open to various problems concerning developments in digital culture and phenomena. We are interested in working with scholars from different research and applied fields, such as semiotics (both applied and theoretical), communication studies, marketing and advertising, linguistics and literary studies, anthropology and ethnography, cognitive science and psychology, and computer science.
More specifically, our interest is directed to:

- New forms of knowledge;
- New media and the immersive e-consumption of experience;
- New forms of social relations in the age of social media;

- New habits of communication and self-expression/representation;
- Online corporate communications;
- Digital narratology and e-fiction;
- Digital grammatology;
- Digital audio-visualisation;
- Internet linguistics.

The magazine is supported and reviewed by our International advisory board as well as by chosen external reviewers.

For more information and submission of papers: DigitASC@nbu.bg

CONTENTS

CONCEPTUALIZING DIGITAL REALITY THROUGH METAPHORS: SEMIOTIC AND INTERDISCIPLINARY PERSPECTIVE

Kristian Bankov &
Federico Biggio

Metaphors have always played a fundamental role in conceptualizing digital realities. Their everyday use, however, makes them challenging to recognize, as they have solidified in our shared imagination. This crystallization is precisely what enables a community of interpreters to attach meaning to a signifier, allowing mutual understanding.

Commonly, we tend to think first of the metaphors which support human-machine interaction, i.e., WIMP metaphors that allowed for the passage from textual CLI (Command Line Interfaces) to GUIs (Graphical User Interfaces). Such two communicative entities, the human and the machinic ones, speaking mutually incomprehensible languages, have relied on strategies of process concealment and intention formulation. As media theorist Marianne Boomen notes, the long-standing tradition of UI design

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has standardized various strategies for de-presenting computational complexity, as can be seen, for instance, in skeuomorphic aesthetics. Boomen references N. Katherine Hayles' concept of material metaphor, involving metaphors where transference occurs not between different words or concepts but between words, symbols, and physical artefacts (Hayles 2002: 22). These metaphors played a crucial role in popularizing groundbreaking technological innovations which were otherwise difficult to commercialize in their "native" engineering terminology. They facilitated the domestication of digital technologies in the media ecology of the 1990s, performing metaphor's primary role of transferring meaning from familiar domains to emerging domains lacking an established semantic space.

It can be argued that metaphors and intersemiotic translations among interfaces have always played a pivotal role since the breaks of referentiality between the symbolic and the real generated by the digital as a paradigm for the representation of electric states (Siegert 2018).

The role of metaphors in graphical user interfaces focuses on one of the main functions of metaphor in communication, that of facilitating the transfer of information, i.e. acting as a container for a concept. In modern Athens, the vehicles of mass transportation are called "metaphorai". To go to work or come home, one takes a "metaphor" – a bus or a train. Stories can also take this noble name: every day, they traverse and organize places; they select and link them together; and they make sentences and itineraries out of them. In this regard, they are spatial trajectories (De Certeau 1984: 115). However, the function of metaphor goes far beyond the pragmatic simplification that the translation and packaging of a concept provides for. Also, as Eco remarked (1984), the discourse on metaphor would require a reflection on rhetoric and the multimodality of language in general. In a general sense, it is possible to say that the metaphor in the contest of human interaction machine plays the function that tradition has always entrusted to this rhetorical figure: the cognitive function.

As we know, Lakoff and Johnson have proposed that three types of metaphors be thought of. They are based on the relationship they maintain with structural, orientational, and ontological.

First, structural metaphors represent cases where one concept is organized through another. In the context of digital realities, the most evident example are spatial entity metaphors. Fictional narratives have played a key role in shaping our collective technological imagination, from cyberspace to the metaverse. Similarly, media studies have, over the years, introduced conceptual tools in metaphorical terms: from the "universal library" to

"virtual squares", from "digital semiospheres" (Hartley, Ibrus, and Ojamaa 2021) to "platfospheres" (Bankov 2020), to describe, respectively, knowledge workers, virtual communities, and the cultural and political dynamics within digital spaces. In the same vein, several spatial conceptualizations of computing, from the filter bubble to the digital panopticon, have also been advanced in recent years by media criticism to question the mode of functioning of algorithmic and automatized media.

Moreover, metaphors for digital realities are not only about static entities but also about processes. From expressions which evoke the sphere of human labor, such as "server farms" or "data mining," to those that describe human-machine interaction in terms of aquatic practices – from the idea of "surfing the web" to that of "streaming" – it is possible to collect different kinds of expressions through which digital uses are thought of.

Finally, the category of structural metaphors includes theoretical formulations that go under the name of media ecology, a paradigm which lies at the foundations of a thought made up of "turns", "evolutions", and "hybridization". Authors such as Carlos Scolari (2012) or Michele Cometa (2024), for example, have recognized and theorized the contemporary tendency to think of the media and their history in biological and ecological terms by re-actualizing interdisciplinary framework by authors such as Vernadsky or von Uexküll. Whole sub-disciplines, such as ecosemiotics (Maran), have posed their basis on these rhetorical assumptions as well.

However, while the epistemology of media ecology has never really taken root in university programs, the bio/eco-logical metaphor has become one of the mostly adopted in discourses on digital culture to describe user experience. Just think of the idea of info-obesity or the counterpart, the digital diet or detox, to virality as a form of contagion.

Secondly, unlike structural metaphors, orientative metaphors organize a set of concepts with respect to spatial orientations such as up-down, front-back, on-off, center-periphery and near-far. On the one hand, it was the software and interface studies which, to integrate with a humanistic perspective the study of complex computational systems, advanced and contributed to the standardization of a mostly vertical topology of these. Nake, for example, suggested that everything that comes out of the computer exists as both a sensibly perceptible surface (Oberfläche) and symbolically manipulable subface (Unterfläche) (Nake 2008). This argument aligned with Manovich's concept of the digital image as a product of algorithmic manipulation and computation, highlighting the distinction between the visible surface and the underlying code or data (Manovich 2001).

This topology between the superior and the inferior has become foundational in media studies, adhering to a semisymbolic logic where that which is deep is often understood as invisible. It is only a few years ago, just before the hype for generative artificial intelligence, reflection driven by the desire to decode for deep learning, the invisible side of Artificial Intelligence. The concept of Deep Time by Siegfried Zielinski follows a similar logic, questing into the hidden layers of media development. On the other hand, not below the interface but above, we find the cloud computing metaphors or the idea of virtual economy traveling instantaneously through the air or "skyway" (Hu 2015). Here, one might again question whether metaphors of cloudiness and fluidity truly represent the "visible" – yet soft – aspects (and hiding counterparts) of an otherwise invisible and weighty material reality (this notion aligns with certain techno-semiotic perspectives on media rhetoric, which tend toward erasing the material dimension of media; cf. Gomez Mejia 2014). As Jonathan Crary describes in sombre tones in his latest book, this reality brings substantial environmental consequences.

Vertical topologies aside, the biological metaphors already mentioned – which obviously include contemporary formulations based on the model of the semiosphere – have also provided a framework for thinking about dynamic processes of crossing between internal and external. This category includes the different topographies of internet spaces and communities which live in or have lived there, from those based on the rhizomatic model of the network (Volli; Bory), to that of the semiosphere (Thibault), in order to arrive at the more properly geographical and mathematical models that have relied on data visualization (Dodge & Kitchin 2001; Reyes 2017). A good representative of this position is Prensky (2001), according to whom the digital semiosphere is inhabited by two main subcultures and to illustrate this concept he uses the now famous metaphorical binomial: digital natives VS digital emigrants.

However, such a case seems to represent already a shift toward the third kind of metaphor proposed by Lakoff and Johnson, i.e., ontological which attaches the properties of objects and substances to concepts. Indeed, personification metaphors are the main example of this category. Since the early days of the Internet, we acquired the habit of interacting not with machines but with different forms of life such as mouses, (anti) viruses, bugs, spam and thumbnails, that populate environments made of windows, ports, clouds, kernels, engines, platforms and so on (Pasquinelli 2008; Thomas 2013).

Nevertheless, translating a computational process in a kind of "person" is not just a structuring operation but a very transferring of functions to a

cultural type. In the analysis of The AI Creation Meme, Singler 2020 highlighted the importance of the religious theme in the representation of human-AI interaction. At the same time, similar analyses in the same direction have highlighted how contemporary strategies AI anthropomorphism and personification raise ethical questions, mainly related to gender and ethnic equality.

Ultimately, this category includes the idea of virtual reality as a space in which to immerse oneself. As pointed out by the theoretical average Murray, immersion is a metaphorical term derived from the physical experience of being submerged in water, and we seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool (Murray 2001: 98–99).

Hence, the function of metaphors is not only to illustrate properties of objects or facilitate their comprehension. Rather, "human conceptual categories have properties that are a result of imaginative processes (metaphor, metonymy, mental imagery) that do not mirror nature" (Lakoff 1987: 371) and things as they are.

In this regard, it is important to bear in mind how metaphors contain a semio-political dimension, that is, provide speakers with (non-a-ideological) interpretative patterns. We have already seen that in the case of cloud metaphors concealing material sides of technology. However, the examples could go much further. As Wendy Chun argued, "software has become a metaphor for the mind, for culture, for ideology, for biology, and for the economy. […] [It is] a powerful metaphor for everything we believe is invisible yet generates visible effects, from genetics to the invisible hand of the market, from ideology to culture" (Chun 2005: 2). In such a perspective, it could be possible to refer to Bogost idea of procedural rhetorics as a way to creating, explaining, or understanding (i.e., interpreting and translating) processes, or to Galloway's definition of algorithm in terms of an allegory of a certain behaviour. In particular, the author argued, video games are, at their structural core, in direct synchronization with the political realities of the information age. This does not mean – necessarily – that language is a deterministic technique, i.e. the cultural metaphors crystallized in the imaginary determine an interpretation, even if certainly in part this is true. Staying within the boundaries of digital realities it is sufficient to state that not only a representative entity but a process – an algorithm, a behaviour, a video game – participate in the production of the real and become at the same time an explanatory model of the world increasingly widespread and an increasingly commonly accepted metaphor of a different reality (Giuliana 2024: 22).

Metaphors, in this perspective, are not innocent artefacts. They also provide a specific understanding of the relationship between the user and reality. According to Hillis, for example, cyberspace and VR are both metaphors and figurations of the promise of an escape from history with a capital H. Cyberspace not only suggest that an ideal existence is one that is technologically mediated, it also continues and intensifies a long-standing project to alter, via the use of technology, subjectivity and the meaning of what it is to be human (Hillis 1999: xvii).

It is precisely in this function of metaphors that lies the interest in semiotics and cognitive studies, that is to say in their power to support encyclopaedic categorizations.

Nevertheless, as metaphors fulfil cognitive functions both towards the outside and the inside, they play a central role to define also what the very cognition is (and what is in relation to artificial intelligence and digital realities). For several years this theme has been inflaming the so-called digital humanities and the philosophy of technology. They are both engaged in the dual task of rejecting the analogy between the human mind and the computer (starting from the insights of Dreyfus and Winograd & Flores) and, at the same time, to justify the persistence of psycho-cognitive approaches to human-machine interaction design, which ultimately keep the user safe from the uncanny valley.

Nowadays that screen-based technologies have become pervasive, acknowledging the cultural meanings of these metaphors, crystallized in the technological imagination, is an imperative move for distancing oneself from the artefact. They operate something like a reverse conceptualization of reality, something that is already in place in the different generations of users. The content of the original metaphors becomes the foundational reality for semantic prototypes. This is when the first "mouse" you encounter is a computer mouse, long before you have grasped the functions of your own memory, you are begging your parents for a console with more memory, or you are reimagining "freezing" as your computer repeatedly stalls – ironically, because the air is too hot for its processor, and so on.

Something like a derivative paradox of this complex semantic situation occurs in the field of education, where digital literacy is increasingly committed to promoting a critical and demystifying reading of the user experience. Digital immigrants teach digital natives how to make it in a digitally dominated socio-economic reality. The communication problem is obvious, but it seems to be only on the surface of a deeper clash of worldviews, where there is a divergence in the fundamental values and even in the structure of temporality.

Several media scholars, for example, have argued that the metaphorical idea of media as prothesis of human cognition was becoming a sad reality since the cultural explosion of the Web in the 90s. In pessimistic tones, they argued that digital culture, especially among digital natives, was marked by a significant decline in cognitive abilities such as focus, memory, and reasoning. On the contrary, others have argued that cognition is, by its very "nature," inclined to extend itself into technical artifacts – that cognition, in essence, consists of the entire system of human cognitive organs, including the body and technologies, therefore suggesting that adopting overly apocalyptic attitudes might be misplaced.

The question to be asked therefore concerns both the semiotic nature of worldviews and the socio-economic dynamics of production of those – since, in large part, we are talking about commercial products. This is the direction in which the most critical speeches have moved, for example, attributing the semiotic pollution to large multinationals, and especially to the continuous software and hardware upgrades to keep the hype alive for a product category (Chun 2016).

This seems to be, in the end, the most common perspective today. It is a perspective which allows us to overcome technological determinism and, at the same time, to keep thinking about the forms of cultural forces that express in shared language forgings and updates.

We are happy to open our collection of papers with "The Blue Brain Metaphor for AI" by **Bent Sørensen** and **Martin Thellefsen** which explores the cultural and semiotic implications of the "blue brain" metaphor commonly used in visual representations of artificial intelligence (AI). The authors analyze how this metaphor serves as visual shorthand for human-like cognition and intelligence in AI, capitalizing on the symbolic association between the human brain and computational systems.

They argue that the metaphor positions AI within a socio-cultural "encyclopaedia," a term borrowed from Umberto Eco, which organizes collective cultural knowledge and interpretive frameworks. This encyclopedia shapes how society interprets metaphors and symbols, particularly in complex areas like AI. The "blue brain" imagery, frequently used by stakeholders (like tech companies, media, and educational institutions), is identified as a powerful tool for conveying AI's cognitive potential and its human-like qualities, while also invoking trustworthiness through the color blue.

The authors discuss how the previously mentioned metaphors such as "the computer is a brain" and "the brain is a computer" create a basis for public understanding of AI, fostering a perception of AI as a parallel to human intelligence. This anthropomorphization may make AI appear less intimi-

dating but can also lead to misunderstandings about AI's capabilities, such as its supposed autonomy and cognitive depth. By analyzing this metaphor through Eco's framework, Sørensen and Thellefsen examine its dual function as both a familiar image and a source of potential misinterpretation.

The paper concludes by highlighting the role of the "blue brain" metaphor in framing societal attitudes toward AI. They include ethical concerns, potential biases, and implications for human agency, suggesting that this metaphor will continue to shape discourse around AI's future development and integration into society.

The paper "Conceptualizing Visual Metaphors in High Tech Product Advertising" by **Sevim Taneva** examines how visual metaphors in advertising impact consumer perception, particularly in high-tech product ads. The study is grounded in a theoretical framework of metaphorical expressions and includes an empirical analysis of metaphor usage. Conducted through an online survey of 301 Bulgarian respondents, the study covered multiple high-tech sub-industries, such as audio, cybersecurity, financial services, telecommunications, and computer technology, and analyzed consumer responses to various visual metaphors used in these advertisements.

The findings reveal that visual metaphors in advertisements can be powerful tools for evoking emotional responses, engaging curiosity, and shaping brand perception. However, comprehension varies significantly, with abstract metaphors often misunderstood. Around 41–64% of respondents reported difficulty in understanding the metaphors, particularly those for complex products like digital security and computer technology, supporting the hypothesis that abstract metaphors pose interpretation challenges.

The study highlights the need for consumer research in metaphor-based advertising, in order to ensure clarity and alignment with brand messaging. Effective metaphorical advertising can enhance the ad's Empathy, Persuasion, Impact, and Communication (EPIC) metrics, but only if metaphors resonate with the target audience. Findings also suggest that abstract metaphors can reinforce brand identity but require careful consideration to avoid misinterpretation.

A very important contribution is the paper "Generative Media: Sign, Metaphor, and Experience" by **Everardo Reyes** who explores the field of generative media, analyzing its development, semiotic principles, and impact on user experience. Generative media refers to content created with AI-driven systems, and the paper broadly defines "text" to include written, visual, and interactive forms. Using Roman Jakobson's communication model, Reyes examines how generative media shifts decision-making in content creation, allowing AI to play a role in message formation.

The paper outlines the evolution of generative media from early computer art in the 1960s to today's AI technologies, such as GANs (Generative Adversarial Networks) and diffusion models. The key attributes of generative media – synthetic, dynamic, digital, combinatorial, and agentic – highlight its capacity to produce diverse, responsive outputs. Reyes categorizes generative media interfaces into conversational, web-based UI, and visual programming interfaces, analyzing each from a semiotic and metaphor-based standpoint.

The study argues for a process-oriented and multidisciplinary approach to understand the cultural and communicative transformations of these technologies, emphasizing the importance of transparency and user agency. By considering generative media as both tool and collaborator, the paper encourages a nuanced understanding of the AI-driven content creation process, linking semiotics with emerging digital practices.

The paper "Semiotic Mediation for the Sustainable Digital Empowerment of Older Adults" by **Alyse Yilmaz** and **Khaldoun Zreik** investigates the use of metaphorical language and semiotic mediation in enhancing digital literacy for seniors. The study identifies metaphorical expressions, such as viewing technology as "nests of problems" or "magical" realms, which shape seniors' attitudes toward digital tools. Through qualitative observations in digital literacy training, the authors explore how these metaphors reflect underlying fears, identity concerns, and cultural barriers. They argue that empowering older adults digitally requires not only technical training but also addressing these symbolic perceptions.

The research suggests that a holistic, identity-focused approach to digital learning – integrating symbolic mediation to demystify technology – can foster meaningful engagement and social inclusion for seniors. The authors advocate for digital literacy programs which move beyond skill-building, instead enabling seniors to perceive themselves as active digital participants. The study ultimately contributes to broader efforts in digital inclusivity, aiming to promote equitable digital access and cultural relevance in the design of technology training for diverse, traditionally marginalized populations.

The paper "Metaphor of the Database: A Taste Construction" by **Karina Astrid Abdala Moreira** explores the metaphorization of databases in generating new tastes through artificial intelligence. Drawing on Lakoff's theory of metaphor and Peirce's semiotics, Abdala argues that databases do not simply store information but metaphorically shape experiences, particularly in translating sensory perceptions into digital forms. The study examines how AI tools like Sous Chef and Flavor Graph create novel gas-

tronomic experiences by digitizing chemical and sensory data to suggest new ingredient combinations. The paper emphasizes that this translation of sensory experiences into digital frameworks relies heavily on metaphor, which enables AI to replicate and innovate within the culinary domain. Through case studies, Abdala illustrates that metaphorization in databases plays a crucial role in reinterpreting human sensory experiences, raising questions about authenticity and the role of AI in creative processes like taste-making. The study highlights the semiotic significance of sensory translation, connecting cultural, cognitive, and sensory dimensions in the context of taste.

The paper "Metaphors of Subversion in Surveillance Art Photography" by **Raluca Vârlan-Bondor** examines how visual and discursive metaphors are used in contemporary surveillance art, in order to challenge traditional surveillance practices. Analyzing works by artists like Tomas van Houtryve, Hasan Elahi, and Mishka Henner, the study identifies how these artists employ visual metaphors to subvert and critique surveillance systems. Using the frameworks of social and cognitive semiotics, the paper categorizes subversive metaphorical techniques, showing how surveillance art disrupts the observer-observed dynamic, often engaging audiences in counter-narratives that provoke thought on privacy, authority, and public spaces. The study highlights that such art embodies "artistic hacktivism," thus reshaping social perceptions and urging critical reflection on surveillance culture and digital privacy.

The paper "The Mythical and Technomagic Aquatic Metaphors of Digital Aesthetics as a Semiotic Empowerment of the Female, Oneiric, and Translucent Imaginary in the Techno-Art" by **Paulo da Silva Quadros** explores the influence of mythical and "technomagic" concepts in digital aesthetics. Drawing on Michel Maffesoli's idea of technomagic, the author examines how liquid and dreamlike visuals in digital art reflect a feminization of the cultural sphere. This approach highlights how aquatic metaphors in digital art re-enchant human existence, evoking feminine archetypes and reconfiguring social relations. Through cultural semiotics, Quadros analyzes the symbolic significance of these visual metaphors in art forms like music, video, and virtual installations. The study suggests that these metaphors of fluidity and transformation empower a feminine aesthetic, reimagining digital spaces as immersive, interactive, and oneiric, thereby fostering a deeper cultural and social awareness in contemporary digital art.

The paper "Conceptualizing Digital Reality through Metaphors in Public Service Announcements: A Semiotic Perspective" by **Nataliya Lysa** examines how digital reality is presented through metaphors in public ser-

vice announcements (PSAs) using a semiotic framework. PSAs, designed to convey critical social messages, are explored as complex cultural signs created by social institutions to influence public perception. Lysa argues that as digital technology becomes increasingly embedded in daily life, it reshapes cognitive structures and meanings through digital metaphors, which play a crucial role in PSA effectiveness. The paper integrates Peirce's semiotics, in order to analyze how these metaphors enhance public engagement by merging visual, linguistic, and auditory elements, making complex messages more accessible. Through case studies, Lysa demonstrates how these digital metaphors evoke emotional responses and cultural resonance, fostering a more profound understanding of societal issues among diverse audiences.

The paper "Enhancing City Identity through Digital Metaphors" by **Konstantinos Digkas** explores how digital metaphors in social media campaigns impact city branding, particularly in attracting younger audiences. Using a multimodal analysis of Thessaloniki's recent promotional campaign "City Break off the Beaten Track," Digkas examines how digital metaphors visually and linguistically shape the city's identity. The study finds that by incorporating modern digital metaphors, cities can create more accessible, engaging, and dynamic representations that resonate with tech-savvy viewers. This approach enables cities to act as "influencers," using social media's interactive nature to enhance their visibility and appeal, ultimately redefining their digital identities to foster tourism and cultural engagement.

The last paper in the collection "Digital Realities and Metaphorical Constructs: A Multimodal Semiotic and Intermedial Analysis of *Blade Runner 2049*" by **Maria Katsaridou** and **Loukia Kostopoulou** analyzes the use of multimodal metaphors, in order to represent digital reality in film. Using Charles Forceville's theory of multimodal metaphors, the authors examine visual, auditory, and narrative elements to explore themes of identity, artificiality, and digitality in a dystopian setting. The analysis highlights how the metaphors used in the film, such as urban decay as societal collapse and memory as identity, address contemporary concerns about digitalization, artificial intelligence, and the impact of technology on human identity. The study situates *Blade Runner 2049* within the context of post-cinema and the post-media era, illustrating how hybrid media forms shape storytelling. By combining cognitive and cultural semiotics, the paper contributes to the discourse on how cinema utilizes metaphor to engage viewers in reflections on the evolving digital landscape and the boundaries between human and artificial beings.

With these considerations in mind, I am pleased to invite you to explore Issue VII of *Digital Age in Semiotics and Communication*, in the hope that it will inspire reflection, insight, and engaging dialogues on the evolving intersections of conceptualization and metaphoricity. This issue owes its realization to the invaluable support of our partners in the ERUA2 alliance and the generous funding provided by the Strategic Development Fund of New Bulgarian University.

Enjoy the journey!

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THE BLUE BRAIN METAPHOR FOR AI

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> No algorithm exists for the metaphor, nor can a metaphor be produced by means of a computer's precise instructions, no matter what the volume of the organized information to be fed in.
>
> (Umberto Eco 1984: 127)

Abstract

Artificial Intelligence (AI) is an absolute key term in contemporary digital reality. It has become an umbrella term for a wide range of technologies developing rapidly, spanning and influencing diverse sectors and domains and, thereby, with an increasing impact on how more and more people live

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their daily lives and/or work. Public discourse on AI often involves metaphor or other imagery and thus a common way to represent AI is by what is sometimes called the "blue brain metaphor". This visual metaphor is frequently used by a number of rather diverse addressers (stakeholders), in order to capture the essential elements of AI by conferring to it human-like characteristics.

In the following work we describe the semiosic background of the "blue brain metaphor" for AI. Inspired by the terminology of Umberto Eco, we understand the metaphor as a function of the socio-cultural format of the encyclopaedia which decides the relevant relations of similarity between AI and the human brain underlying the metaphorical production and interpretation. We address what characterises the "blue brain metaphor" visually and try to interpret (some of) its meanings. We will also accentuate how it builds on to the (old) metaphor: the "computer is a brain". Finally, we briefly describe how the "blue brain metaphor" is related to diverse normative discourse concerning AI.

Keywords: artificial intelligence (AI), metaphor, the "blue brain metaphor", Umberto Eco, encyclopaedia, semantic componential analysis, normativity

1. Introduction

In the tapestry of myriad meanings coined with artificial intelligence (AI), the threads of history, mythology and human ingenuity weave a story not just of technological progression, but also of cultural evolution. The idea of automating or mimicking human thought processes and intelligence, however, predates modern understandings of AI. For centuries, various automata and mechanical devices designed to simulate aspects of human behaviour, or to resolve specific problems, have been an integral part of human history. Before the advent of modern computing, early conceptions of artificial intelligence were rooted in folklore and myths. Stories were told about artificial beings mimicking or surpassing human capabilities (Cave, Dihal, and Dillon 2020). The narratives identified by Cave et al., demonstrate recurrent themes found in the visions of AI, such as the creation of life, the relationship between creator and creation, the potential risk for AI to surpass human intelligence, and the existential risk AI may pose for humanity. Noah Harari and Adrienne Mayer, respectively authors of books on the cultural development of human technology (Harari 2017) and (Mayor 2018), discuss how the ideas and conceptions of technology

and developments of automata and visions of AI are nested in the confinements of cultural developments and ideas. The parallel between the titles "God and Robots" and "Homo Deus" are remarkable, both connecting technological creations to divinity. While grounded in different historical perspectives, Mayor and Harari converge on several points, reflecting on human aspirations, anxieties and ethical considerations, as prevalent implications of technological creations. Both authors showcase how visions of human automata and artificial intelligence stem from a multitude of different factors, rooted in the fascination of technology itself, the quest for understanding and replicating the essence of life and intelligence, and the developments in society. The portrayals of technology and automata exist since the mythologies of ancient times, throughout different historical eras, nurtured by scientific discoveries and prevalent philosophical and theological ideas. Mayor delves into mythology and reveals how stories of automata and ideas of artificial beings were imagined as early as in ancient Greece. They were expressed in the myth of Talos, a giant bronze automaton created by Hephaestus to protect the island of Crete. What makes the myth of Talos of particular interest in our context is the way he is described as an animated mechanical construction, sustained by divine force. Thus, coupling early conceptions of the technological achievements of the time with artificial life, merging the mechanical with the divine. Where Mayor delves into the myths of ancient Greece, Harari turns our attention towards the transforming nature of technology itself, considering it as an integral force of human nature. Harari uses the concept of "Homo Deus" or "God-Man", in order to suggest how technological achievements are a pathway to God-like powers. Harari discusses how AI could foster new forms of experience, and improvements and through developments in biotechnology alter the building blocks of human life itself. Where the ancient myths see the life-force of Talos as given by the Gods, in the age of modern AI, human becomes God and creators of life themselves. Thus, the strong metaphorically based conceptions of technology, automata and robots is deeply engrained in human history and the technological developments which connect visions of artificial beings and intelligence to ideas of the mechanics of life itself, to the danger of autonomous machines, and to the ideas of transhumanism. Transitioning into the age of computers, the focus on AI has shifted from mechanics towards abstract intelligence. The origin of contemporary AI can be traced back to the works of Alan Turing (1912–1954). Alan Turing was a British Mathematician who introduced the concept of universal computing (Turing 1937). Turing's research into computation played a pivotal role in the decryption of the German Enigma code during World

War II. Turing later proposed the concept of the imitation game, later also known as the Turing Test (Turing 1950).His test sets the criteria for a machine's ability to exhibit intelligent behaviour, indistinguishable from that of a human. However, where the physical and mechanical form were prevalent, computation marks a shift towards disembodied intelligence. The term Artificial Intelligence was coined in 1955/56 by John McCarthy in a proposal for the Dartmouth Summer Research Project. Here, the aim for science and engineering was described as making machines intelligent, based on the presupposition that: "every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." (McCarthy et al. 2006). The era of machine learning marks a significant shift in the evolution of AI, starting in the early 2000s, and continuing to the present. The focus on AI shifted from rule-based algorithmic reasoning towards data-driven approaches, enabling machines to learn from experience and improve over time, and make decisions with minimal human intervention. This development is underscored by three pivotal developments: the explosion in data, the advancements in machine learning techniques, and a surge in computational power. As technology has evolved from mechanic machines towards data-driven digital computers, the conceptual metaphors that are used to describe machine intelligence have also evolved, and as such they reflect the dynamic interplay between human ingenuity and technological advancements. In today's information environment, a number of definitions for AI exist. Looking at AI from a broad perspective, this concerns models for processing information for the purpose of performing tasks originally done by humans or computer software systems (involving algorithms) which can perform processes normally understood as involving cognition. For example, these systems can involved the collection of data, in order to recognise patterns, learn from recognised patterns, make decisions, and achieve goals etc. (Demir & Güraksin 2023). AI has now become an umbrella term for a wide range of technologies which are developing rapidly, spanning and influencing diverse sectors and domains. These areas include health and medicine (Obermeyer & Emanuel 2016), legal and compliance (Ashley 2017), business and finance (Bahoo et al. 2024), military and defence (Raska & Bitzinger 2023), as well as transportation and autonomous vehicles (Bathla et al. 2022; Sørensen, Thellefsen, and Thellefsen 2020). Therefore, AI has an increasing impact on how many people live their daily lives and/or do their work: driving public discourse involving both optimistic hopes and pessimistic anxieties. Often the discourse on AI involves the use of metaphors. AI is itself a metaphor (we will return to that later),

and metaphors make it possible for us to think about, make sense of and use AI. This is witnessed, for example, witnessed by metaphors such as machine vision, learning and memory etc. For a number of stakeholders, metaphor serves many purposes in relation to AI. This is particularly the case for – companies commercially bringing AI to the market, organisations/institutions informing the broader public about AI (such as UNESCO and the European Parliament), neuroscientists trying to advance their field (Baria & Cross 2022), or developers designing new AI software (Colburn & Shute 2008). In short, metaphors are used as a valuable tool to explain the abstract/complex subject matter of AI (Baria & Cross 2020). As accentuated by Wallenborn (2022) and Halbryt (2023), when using a search engine for finding images of AI, many (stock) images will show a machine involving a human brain and, often, is the image held in dark/deep blue colours. In the following, we will refer to this as the "blue brain metaphor" for AI. The reason why this metaphor in images of AI has become so common and used by very different addressers is, perhaps simply, because it builds on or is a visual variation of the well-known metaphor "the computer is a brain". Nevertheless, following the terminology of Umberto Eco (and thereby, partly Peirce) (1984) we can say, that AI, as a "blue brain metaphor", has become a prominent node in a semantic network. Series of interpretants represent metaphorical meaning potentials of AI and make it meaningful within a larger (socio) cultural encyclopaedia.

The question is then, if this visual AI metaphor is a (semiotic) consequence of the encyclopaedia of interpreting subjects then what readings are possible, why are they possible, and can new paths be discovered by semiotic relationships within the encyclopaedia?

The purpose of this article is therefore two-fold: Firstly, to describe the semiosic background for the "blue brain metaphor" for AI, and, secondly, to give different readings of the metaphor inspired by Eco's semantic componential analysis. We will begin with the more obvious interpretations of the metaphor, hopefully moving on to more diverse, complementary and/or perhaps contradictory meanings. Finally, we will briefly address some normative implications of these interpretations of the visual "blue brain metaphor" in relation to the (encyclopaedic) understandings cultivated by the public discourse.

2. Metaphors, the Computer and AI

Metaphors are central to language, thought, feeling, and experience and the intricate relationships between them. For the last 40-50 years or so, this has been argued within fields and disciplines, such as, linguistics, psychol-

ogy, philosophy, and semiotics (Black 1962; Ricoeur 1978; Lakoff & Johnson 1980; Eco 1984; Ortony 1993; Gibbs 1994; Gentner et al. 2001; Brandt 2004). For centuries metaphors have been used to make technology meaningful, enabling its understanding and use. They have been used to represent something abstract in terms of something (more) concrete or well-known. Formulated differently, metaphors can frame the relationship between humans and technology and, thereby, mediate (Rosenberger & Verbeek 2015; Sørensen, Thellefsen, and Thellefsen 2024), not only the use of technology as such, but also the relation between humans and their world (Chown & Nascimento 2023). The "blue brain" metaphor for AI is based on or is related to, of course, the metaphor "the computer is a brain". That is, the computer is represented by an anthropomorphising metaphor where it has human(-like) qualities/characteristics. In the 1940s, popular computer magazines suggested how the computer could "think" and had a "memory" (Berry 1993) and, today, we all know that the computer can sleep, wake up, become sick (when it has a virus), see, read, accept, and check our spelling etc. etc. The word computer was etymologically already recorded in the beginning of the 17th century referring to someone doing computing or calculations in an observatory (Oxford English Dictionary 2024, online). In the 1940s, the word computer was still used in this way, for someone doing calculations for engineers. However, also in the late 1940s, when programmable digital devices were designed to do the same task, these devices were denoted "electronic computers" quite quickly. However, they were just called computers (Videla 2017). Hence, calling the computer a "computer" has all along been a metaphor, not surprisingly, involving a meaning potential where "the computer is a brain". Furthermore, "the computer is a brain" metaphor is related to another well-known metaphor, namely, "the brain is a computer". Brain functions are understood in terms of computer functions: for example, processing information or having input data activating perception (Baria & Cross 2021). Not only, "the computer is a brain" metaphor, but, also, "the brain is a computer" metaphor, and their sometimes entangled meanings, are a part of the semiotic possibilities for representing, describing, and explaining AI. The "computer is a brain" and the "brain is a computer" metaphors are part of the same metaphorical language, where AI e.g., can make sense of data, learn and even has a neural network such as human brains. Formulated differently, AI is related to certain potentials of meaning involved within what we below, along with Eco, will call the encyclopaedia. This is understood as a multidimensional space for semiosis and shared knowledge (Desogus 2012), which, inter alia, governs the production and interpretation of metaphors. Let us therefore look into the semiosic background for the AI metaphors.

3. The Semiosic Background of the "Blue Brain Metaphor" for AI

Before going into possible interpretations of the "blue brain metaphor", inspired by Eco, we will now consider the semiosic background for the metaphor: where the concepts of similarity, interpretant and encyclopaedia are central. Furthermore, we will look into Eco's suggestion for a componential analysis of the semantics of metaphors, which, methodologically, can guide our interpretations of the AI "blue brain" metaphor. Finally, we briefly address how AI metaphors (in general) offer perspectives on the encyclopaedia.

3.1 The "blue brain metaphor" for AI rests on a relation of similarity Looking at the image of the human brain, constructed from intricate circuit lines glowing with an electric blue hue, the human brain is a visual metaphor for AI (see Figure 3); or the human brain is metaphorising (parts of) AI. Along with Eco we can say that this metaphorisation is possible due to a relation of similarity between the human brain and AI (Eco 1984: 113). However, that which characterises and qualifies this relation of similarity – the answer from Eco – concerns both Peirce's concept of interpretant and his own encyclopaedia. Eco explains how (every) metaphor is: "produced solely on the basis of a rich cultural framework, on the basis, that is, of a universe of content that is already organised into networks of interpretants." (Eco 1984: 127). The universe of content involves a semiotic dynamic, or infinite semiosis, where signs, qua Peircean interpretants, continuously, interpret other signs into networks of meaning (Eco 1984: 113) – also, regarding relations of similarity (Sørensen 2011: 152–155). Eco writes as follows:

> By similarity…we mean the fact that in a given system of content…properties are named by the same interpretant, whether it is verbal or not, and independently of the object that the objects or things for the designation of which that interpretant is customarily used may manifest perceptual "similarities." (Eco 1984: 111)

The visual metaphorical similarity between the human brain and AI, therefore, concerns interpretants. The similarity has nothing to do with presumed ontological relations or the structure of reality "itself". The similarity is coherent, not motivated, and it depends on rules, codes and conventions within what Eco calls the encyclopaedia. The encyclopaedia is a multi-dimensional space making possible the processes of signification and communication (Eco 2014: 49–60; Desogus 511–515), as well as communicative acts as metaphors (Sørensen & Thellefsen 2014: 104–110), involving images of AI represented as "digital brain" and "blue brain". The

encyclopaedia has no centre, it is, virtually, infinite as a regulative ideal. It is possible to isolate a portion within the encyclopaedia, chains of interpretants, but it will, always, be a local representation (Sørensen & Thellefsen 2014: 206). This is also true of visual metaphors concerning AI and our attempts to understand what they mean. Of course, structured knowledge is possible within the encyclopaedia and truths can be registered. However, the encyclopaedia, furthermore, registers what is believed to be false and even legendary (Eco 1984: 83–84). Hence, the "digital brain" and "blue brain" visual metaphors are semiotic mechanisms which base themselves, and are working within, the encyclopaedia, no matter whether they are true, false or, simply, depends on cultural myths. Arguing for different interpretations of these visual AI metaphors means describing paths within the encyclopaedia where interpretants guarantee validity of the signs. This begins with looking for relations of similarity between what is metaphorising (the human brain) and what is metaphorised (AI).

3.2. Isolating relevant portions of the encyclopaedia to interpret the "blue brain metaphor" The AI metaphor "blue brain" has been created, and subsequently interpreted, and will be interpreted in the future – on the basis of a rich semiotic network: the encyclopedia, organized into, virtually, infinite series of interpretants. So, the following question naturally arises: how can portions of the encyclopaedia be represented meaningfully, in order to interpret the visual AI metaphor – when the series of interpretants are virtually infinite (Eco 1984: 117; see also Jensen 1993). Eco suggests a method for possible interpretations of metaphors which is based on Aristotle's four causes. He writes: "It is a representation based on nothing other than the four Aristotelian cases (efficient, formal, material, and final), it being clear that these are assumed in merely operational terms without metaphysical connotations." (Eco 1984: 115). And, Eco, furthermore shows, using the representation of a noun /x/, how such a representation looks like:

/x/)	F(orm)	A(gent)	M(aterial)	P(urpose)
	Perceptual aspect a x	Who or what produces x	What x is made of	What x is supposed to do

Figure 1: Eco's representation of encyclopaedic properties (Eco 1984: 115)

In order to interpret a metaphor, we first need to make a componential description of "what", potentially, is metaphorising. Then after this description, we must look in the encyclopaedia for "something" which can be metaphorised – because it shares some interpretants with "what" is poten-

tially metaphorising it. In our case concerning the visual AI metaphor, we already know, of course, that we are dealing with a relationship between the human brain and AI. Nevertheless, it seems methodologically relevant to follow Eco's semiotic suggestion for the interpretation of metaphors because it permits us to understand the AI metaphor as related to parts of the encyclopaedia. However, a componential (semantic) representation of the encyclopaedic properties involved in the visual AI metaphor cannot stand alone (analytically).We also need to remember how certain constraints will influence our interpretations of this metaphor. Following Eco, there is a contextual pressure that potentially activates a given portion of the encyclopaedia, and, thereby, proposes interpretants underlying the relation of similarity in the AI metaphor. This contextual pressure concerns the identification of a theme, i.e., that which is being talked about with the metaphor, including from what perspective and to what end this is being talked about. In short, a topic or certain frames are involved which restrict which interpretations of the AI metaphor are possible or seem to make sense concerning their underlying series of interpretants (Eco 1984: 117–118).

3.3. The AI metaphor as perspectives on the encyclopaedia

It is important to accentuate that the encyclopaedia is not a static or coagulated semantic structure. The encyclopaedia, qua the Peircean interpretants and the processes of infinite semiosis, allows for new creative semantic couplings. AI metaphors are indeed semiotic mechanisms with potentials for semantic innovation: if they, to some degree, are creative. Eco writes how some metaphors provide: "a new semantic coupling not preceded by any stipulation by the code…but which generates a new stipulation by the code." (Eco 1976: 284). Formulated differently, metaphors can provide: "shortcuts within the process of semiosis" (Eco 1984: 129). Indeed, these shortcuts can convey new patterns of signification within the encyclopaedia where portions of the encyclopaedia become re-arranged with the effect that the encyclopaedia becomes expanded or new semiotic potentials arise. Furthermore, for Eco, the encyclopaedia does organise the ways in which we see the world or how we think about it. So if metaphor can re-organise or perhaps create new parts of the encyclopaedia, it can also rearrange or create new meanings concerning how we think – including how we are thinking about AI. Finally, we should remember that AI metaphors (as every other metaphor) only activate or rearrange a part of the encyclopaedia. They therefore represent a point of view seen from the perspective of similarity which concerns series of interpretants. This also means, that AI metaphors involve a semiotic effect where they will focus

on some interpretants and not on others; or the AI metaphors emphasize some semantic similarities between what is metaphorizing and what is metaphorized – while other similarities as well as differences will not appear or may be down toned or even (purposefully) hidden (Jensen 1993: 102). Other similarities as well as differences will not appear or may be down toned or even (purposefully) hidden (Jensen 1993: 102). Through the encyclopaedia, the AI metaphors thus potentially enable certain ways of thinking while restricting others (Halbryt 2023). At the same time, they can influence and define what is culturally meaningful as well as significant concerning AI: including consequences for what is considered true and false, good and bad, right and wrong, and thus impacting social behaviour, for example.

3.4. The blue brain metaphor for AI

In the previous pages, we talked about *the* "blue brain metaphor" for AI. We mentioned how both Wallenborn (2022) and Halbryt (2023) stress that AI is often represented in (stock) images by a blue brain metaphor. Although the two authors do not present any statistical premises for their conclusion, we believe that they have an important point – which we will return to below. In a thought-provoking article, Cave and Dihal (2020) argue how AI is predominantly portrayed as white referring to colour or ethnicity or both. They also examine, inter alia, stock images but do not mention metaphor. In order to indicate the prevalence of racialised AI in stock images, as the two authors call it, they undertook two image searches on Google (using the Tor browser) for the term "artificial intelligence" (on the 13th April 2020). In relation to our article, the interesting fact is, that the top 18 image results of their search showed that four images displayed "Whiteness", but also that a number of images: "were too abstract, featuring stylised brains and circuits" (Cave & Dihal 2020: 692). Then, we indeed return to the "blue brain metaphor" for AI. That is, when we look at the screenshot of the 18 top results found by Cave and Dihal, we can see that at least nine of these images involve versions of the "blue brain metaphor". We are not saying that Cave and Dihal do not have a good point when they argue for a prevalent "Whiteness" in categories such as the representation of AI concerning humanoid robots, portrayals of AI in movies and television as well as stock images, what we are saying is, that there also is an important category of stock images which concern AI involving the "blue brain metaphor". This is indeed shown by the search by Cave and Dihal shows. Four years after Cave and Dihal, we conducted the same Google image search for the term "artificial intelligence" (see Figure 2).

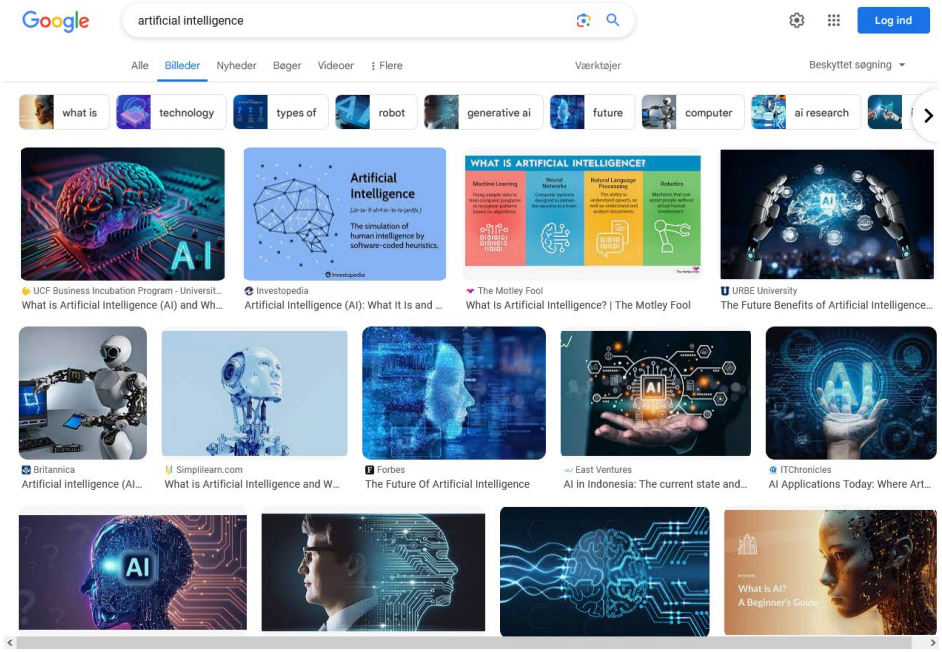

Figure 2: Tor browser Google image search result for the term "artificial intelligence", 27th March 2024

Hence, also today can we find a number of examples of the "blue brain metaphor" for AI. Of the 13 top search results seven images involve the metaphor. Thus considering both the search result found by Cave and Dihal as well as our own, we can return to Wallenborn (2022) and Halbryt (2023) and say that we support their claim: AI in stock images is often represented by a "blue brain" metaphor. So, what do we mean, more precisely, in the following, when we talk about the "blue brain metaphor" for AI? First, or most obviously of course, we mean a visual metaphor which depicts/represents a human brain with a blue hue. Furthermore, the brain often involves interconnected lines constituting a circuit; and the brain is encased in a head seen in profile. Finally, some "blue brain metaphors" appear within a visual context where 0s and 1s or some programming code is shown. Below we will make an interpretation of a stock image used by UNESCO which involves the "blue brain metaphor" for AI, possessing all the characteristics already mentioned. Or formulated differently: We believe that this image involves a good (representative) example of the "blue brain metaphor" for AI.

4.0 Interpreting the Blue Brain Metaphor for AI

Figure 3: The blue brain metaphor for AI
https://www.unesco.dk/videnskab/kunstig-intelligens

We find this image on the website for the Danish UNESCO-National Commission (Den Danske UNESCO-nationalkomission). Above the image we read the headline "Artificial Intelligence" (Kunstig Intelligens) and with the sub-headline the viewer learns how "UNESCO will set common international standards for the work with artificial intelligence" (UNESCO vil sætte fælles internationale standarder for arbejdet med kunstig intelligens). Furthermore, UNESCO accentuates how AI is spreading to more and more areas of life and it concludes that AI seems to involve almost endless possibilities, but also, challenges and risks. Finally, when UNESCO defines AI, it is described as being built on mathematical models, algorithms, and while AI cannot, in the strictest sense, think, UNESCO concludes that it undoubtedly can be programmed to learn from experience. The image, unsurprisingly, involves that which in the previous pages we called the "blue brain metaphor" for AI. Therefore, using the terminology of Eco, we already know the topic or what the visual metaphor is about. If we did not know the topic, the immediate (con)text of the web page (its headline etc.), will guide our interpretation to the conclusion: that the topic is AI. Furthermore, we know that the human brain is metaphorising AI. More precisely what do we see when we look at the image from the UNESCO website? First, the central focus of the image is an outline of a

human head and brain seen in profile. The outline is white and glowing. The central figure of the image is encased in a sphere made of a complex network of interconnected lines. Furthermore, the interconnected lines are also surrounding the central figure. In the background of the image, we see sequences of the numbers 0 and 1. The sequences are visible on both sides of the central figure, and they glow in a blue light. The overall colour scheme is dominated by various shades of blue. Bright neon-like elements illuminate certain aspects of the image. Let us keep this brief description in mind. Now we will try to represent the metaphorising human brain with relevant interpretants from the encyclopaedia, thus returning to Eco's proposed "case grammar" analysis of metaphor based on the four Aristotelian causes.

/The human brain/ (	*F(orm)* Perceptual aspect of x	*A*(gent) Who or what produces x	*M(aterial)* What x is made of	*P(urpose)* What x is supposed to do
	Organ composed of neurons, biochemical	A product of biological evolution	Biological matter	Enable consciousness, feeling, thought, control etc.

Figure 4: A case grammar analysis of the metaphorising human brain

A similar representation of the metaphorised AI can be formulated as follows:

/AI/ (	*F(orm)* Perceptual aspect of x	*A*(gent) Who or what produces x	*M(aterial)* What x is made of	*P(urpose)* What x is supposed to do
	Digital representations	Created by humans; computer scientists, engineers, developers etc.	Digital data and algorithms	Automate tasks, mimic human intelligent behaviour

Figure 5: A case grammar analysis of the metaphorised AI

Thus, it is possible to select a number of interpretants from the encyclopaedia which represent the metaphorising human brain and the metaphorised AI respectively. We thereby see certain similarities and differences between the two entities. The differences are obvious. In particular, they concern the aspects of A and M. The human brain e.g., is a product of biological evolution over millions of years involving natural selection. AI, in contrast, is produced by humans using sophisticated programming languages, coding, and techniques regarding machine learning etc. Furthermore, the human brain consists of biological matter. It includes, for example, neurons, glial cells, blood vessels and different neurotransmitters, whereas AI involves digital data within the memory of computer systems and servers represented by algorithms and data structures. We must therefore find the similarities (qua interpretants), underlying the possible metaphorical semiosis, and which involve the human brain as metaphorising and AI, as metaphorised, in relation to the aspect of P or what "something" is supposed to do or serve for. Then, we return to the "computer is a brain" and the "brain is a computer" – because the similarities regarding the P aspect seem to concern certain functionalities and processes. However, looking at image, what is it more specifically that leads us to this interpretation? Firstly, as mentioned before, we can see that the brain involves a complex network of interconnected lines. Furthermore, on both sides of the brain/face there are sequences of 0s and 1s. Finally, the website describes (verbally) AI as capable of learning. It is this complex of possible visual and verbal signs which we understand as the premise for our interpretation: identifying relevant interpretants for the metaphoric relation of similarity. It is not possible to say what a potential viewer of the website actually knows about the human brain and AI, yet it is (in principle) known what language or other semiotic systems have already said (in the encyclopaedia) about these two entities. Therefore, looking at the image and the brain with its intricate network of interconnected lines, we can say that these lines constitute a circuitry which represents how (billions) of neurons (the basic information unit of the brain and nervous system) form networks enabling information processing and thereby cognitive processes. Furthermore, the sequences of 0s and 1s, glowing in the background, feature a binary code which is often used to represent data or processing of information. Thus, taking this into account we can point at the below potential significant relations of similarity underlying the "blue brain metaphor" for AI:

- Both AI and the human brain process information. The brain processes and transmits information via vast networks of neurons. AI,

on the other hand, processes information via algorithms and powerful computational operations. AI as well as the brain involve input which is processed to outputs (represented in the image with some of the interconnected lines which are woven in and out of the brain).

- Both AI and the human brain learn. This is done by the brain through a process called synaptic neuroplasticity, i.e. brain learning from experience (where connections between neurons are strengthened and weakened over time through experience). AI, on the other hand, learns from data by means of machine learning algorithms (adjusting their parameters to the exposed data). In this way the brain as well as AI can adapt/improve their performance.
- Both AI and the human brain can recognise patterns. The brain and AI recognise patterns through examples. The brain does this through sensory experience and cognitive processes and AI uses algorithms. Pattern recognition enables both the brain and AI to make, for example, generalisations, predictions and decisions.

Most laypeople viewing the image will not be able, we think, to unfold these relations of similarity in an explicit, self-controlled way (especially with reference to concepts such as neuron, synaptic neuroplasticity, neural networks etc.). However, most viewers will probably say, if they were asked about the meaning of the metaphor, that it suggests AI possesses brain-like characteristics. Some viewers may mention one or more of these characteristics, such as that AI can learn and recognise patterns. Seen from the perspective of the "blue brain metaphor", it is suggested that there is a complex relation between the human brain and AI – a relation which involves a semiotic integration between biological intelligence (the brain) and artificial intelligence (binary code and network connections). Formulated differently: The profile of a human head filled with circuitry not only represents the integration of AI with human cognition but also serves as an iconic sign which can mirror our own biological neural networks. It is the same semiotic potential which is at play as when MacCormac writes how: "We talk about the neuronal states of the brain as if they were like the internal states of a computer; we talk of the mental processes of thinking as if they were algorithmic." (MacCormac 1985: 10). In short, then, and returning to Eco's terminology, we can say that with the "blue brain metaphor" we have a topic which involves a certain *frame* for AI concerning epistemology. Thus, AI is metaphorised, qua the human brain, as something which, for example, can perform tasks due to its ability to think, learn, infer etc. (Watson 2019: 417). In close connection to this is the blue brain metaphor part of

the well-known tendency to anthropomorphise AI. This can be seen in the (more or less intentional) attribution of traits to AI typically inherent in humans, such as cognitive processes and outcomes (Sales et al. 2020: 91; Dippel 2019: 34). As Salles et al. (2020) accentuate, this tendency is driven by the fact that the inner workings of AI "although created by humans, remain inherently opaque for laypeople." (Salle et al. 2020: 90). However, the anthropomorphisation rests on the presupposition that there is a mental similarity between AI and the ways in which the human brain functions and performs etc. The question is whether the wider public (and some experts) understand AI as actually thinking, learning etc. (Dippel 2019: 34 believes so). In any case, with the anthropomorphisation of AI, via the blue brain metaphor, can something abstract and complex become known (to some degree) and seem less complex. Furthermore, can a sense of familiarity with and proximity to AI be created which fosters social/cultural acceptance all because of AI works like the human brain (Wallenborn 2022; Halbryt 2023). The feeling of familiarity with AI is further amplified because the metaphor also involves the profile of face (a silhouette). With the profile of a face follows the representation of a (anthropomorphic) physical entity concerning which the viewer, potentially, can ascribe additional human traits/characteristics to AI: for example, emotion, motivation etc. Reflecting further on the outlined head profile, there are, however, other interpretations possible, including (at least) one interpretation which stands in contradiction to the positive connotations concerning the feeling of familiarity with AI. The outlined head profile is namely also encased within a glowing sphere, and as mentioned above, the head involves an intricate network of interconnected lines (representing a circuit). However, these lines are also interconnected with the network surrounding the sphere. This could suggest that the sphere represents how AI and human thought processes are intertwined (for example in relation to the term "neural network"), but also that the very same thought processes are seen in relation to the boundless and (ever) expanding realm of AI – potentially transcending or surpassing the cognitive abilities by intelligent technology. Formulated differently, with the terminology of Eco, the metaphor also involves a possible frame where AI is spreading to increasing areas of life involving promising (sometimes immense) opportunities. However, at the same time it is complex, challenging and can have negative consequences. Returning to the verbal text of the UNESCO website, this is exactly what is accentuated. In particular, does UNESCO warn about the negative consequences of AI concerning ethics, human rights and security. A question remains, however: why is the visual brain metaphor for AI often presented in the colour

blue and its various shades? It is probably a many facetted phenomena involving different answers, but it seems that the meanings associated with colours rely partly on cross cultural biological abilities and partly on cultural habits. No matter what, however, the potential associated meanings are registered in the encyclopaedia. Let us mention first, though, how it is difficult to imagine that the brain representing AI visually should be featured in its natural colour; the outer part of the brain consists namely of the tissue called grey matter which, unsurprisingly, is (pinkish) grey. Furthermore, blue is a focal colour (together with yellow, red and green) which compared to non-focal colours, corresponds to specific wavelengths of light more easily categorisable by the human eye and therefore more easily identified and remembered by the viewer (Berlin & Kay 1969). Colour is also a vehicle involved in socio-semiotic communication (Kress & Van Leeuwen 2002; Kourdis 2014). The colour blue and its potential meanings are rooted within a society and historically conventional associations (Pastoureau 2001). In 1997, AI and the colour blue became very closely related when the chess-playing super computer from IBM beat the world champion Garry Gasparov. The computer was named Deep Blue (a reference to "Deep Thought" and IBM's nickname "Big Blue"). Not only was this event a milestone in the history of AI, it furthermore made possible a strong association between AI and the colour blue in the wider public. This resonates well with Eco's thought of the encyclopaedia which is not considered a fixed repository of knowledge, but a dynamic and culturally flexible base for signification and communication, constantly evolving as new relations of meaning are added: as when the relation between the colour blue and AI became a significant semiotic possibility within the encyclopaedia. Since then, AI has often been represented with the colour blue in different forms of media, from business logos and branding to visual representations in movies and (digital) art as well as concerning various organisations informing the broad public about AI, for example, using the "blue brain metaphor". Furthermore, the colour blue also involves a number of possible culturally fixed associations. Firstly, the perceived meaning of the colour blue exists within a cultural landscape, (Lavrenova 2023), and as demonstrated by (Pastoureau 2001), the colour blue appeals to meanings deeply embedded within the tapestry of cultural and social values and norms, see also (Broeder 2022). Also, colours invoke psychological effects and can have an important impact on cognition and behaviour (Elliot & Maier 2014). The colour blue is also associated with trustworthiness in commerce (Alberts & Van Der Geest 2011; Labrecque & Milne 2012; Su, Cui, and Walsh 2019). Thus, the use of blue in AI imagery, including metaphors

such as the "blue brain", plays a crucial role in demystifying technology and instilling emotions of reassurance when AI is rapidly developing into various and more and more aspects of modern life. Expanding on this notion, the blue colour also establishes references to the "blue sky", "the blue planet" and the "blue ocean", associating AI with a sense of limitlessness and depth, encapsulating human intelligence within what seems to be the boundless and evolving realm of AI – pointing towards, for example, the future, involving innovation and progress. Finally, a partial (and simple) explanation for the dominance of the colour blue in AI imagery could also be that the tech industry is predominantly male and blue is strongly preferred by men. Thus, this preference could be of some influence in the colour choices of the visual representation concerning AI – also when it comes to the visual metaphor where the human brain is representing AI.[1]

5. Normativity and the Blue Brain Metaphor for AI

Throughout this paper, we have explored how metaphors have shaped the conceptualisation of AI, and how metaphorical expression provides rich and nuanced meanings that can be explained by reference to Eco's concept of the encyclopaedia. The visual representation of AI, here represented by the "blue brain metaphor", suggests how understandings of AI are established by referencing AI to the human brain, suggesting the convergence between the analogue and digital worlds.

This metaphor draws on a range of established cultural norms and values. Below, we will briefly address some normative implications of the "blue brain metaphor" for AI, and thus the understandings cultivated by the imagery in the public discourse.

5.1. Historical and Cultural Contexts

The encyclopaedia is considered both dynamic and open-ended, and thus reflects the interpretation of signs both with reference to actuality, historical roots as well as possible future semiosis. Thus, the general understanding of AI, depicted as digital machinery (0s and 1s) and in the shades of blue colours, invoke certain interpretations that draw on ideas anchored in ancient myths where the blue colour is associated with divinity or eternity (Pastoureau 2001). However, this is also connected to imaginations about technological creations and achievements, and the modern-day narratives of performance, efficiency, reliability and productivity (Labrecque & Milne 2012). From a historical perspective, the developments in tech-

[1] https://forestreet.com/why-is-ai-always-blue/ (accessed 1 April 2024).

nology have always followed a path of easing the cost of human work. As discussed by Harari (2017), humans have used technological achievements to conquer new grounds. However, the narratives also suggest concerns about the inhuman nature of AI, that AI may become too influential, too powerful and obscure, and give rise to ethical considerations of its impact on society. "The blue brain metaphor", however, cultivates different narratives and can sustain the close relationship between AI and human reasoning. However, at the same time, as demonstrated in our example (figure 3), they can invoke interpretations about the boundaries of AI, and thus motivate considerations about how to safeguard and control the future developments and integrations of AI in society. "The blue brain metaphor" may also invoke fears about the efficiency of AI in e.g., decision-making, surveillance, and thus concerns about bias in data and opaque algorithms that influence public life. Therefore, while metaphors indeed do reinforce certain conventionalised concepts and diminish others, the meaning of the metaphor relies on the context in which it is communicated.

5.2. Anthropomorphism and Normativity

Anthropomorphism means to attribute human characteristics to a non-human (animate or inanimate) object. What the anthropomorph projection does is it enables cognitive and emotional perceptions of non-human objects, and in terms of AI, endows the behaviour of AI with human rationality "…*as if* it were a rational agent who governed its "choice' of "action' by a "consideration' of its "beliefs' and "desires" (Duffy 2003: 180). Anthropomorphism thus highlights the similarities and differences between artificial and human intelligence, influencing how AI is understood in society. This mechanism is also called conceptual borrowing (which in our view is synonymous with the metaphor) (Floridi & Nobre 2024), where AI has borrowed concepts from mainly cognitive science and neuroscience. AI is thus endowed with biological and psychological concepts as AI learns and adapts.AI is trained, behaves, has a memory, has neurons, and conducts sensory processing. Consequently, the visual "blue brain metaphor" for AI potentially establishes a conceptual framework which draws on a complex network of terminology often borrowed from other scientific vocabularies. It enables a sense of understanding by representing the complex and abstract notions of algorithms, big data, computation, binary codes, neural engines in more familiar and understandable language. This is a language which reduces, or perhaps shades the complex nature of AI. It can also emphasise certain human like understandings that AI is akin to the human brain, or that the brain is akin to the functions of AI, i.e.,

thinking is computation. Furthermore, the blue colour evokes emotions, which resonate with cultural norms and values, and add these qualities to the AI metaphor. The conceptual framework embedded in the metaphor consequently acts as a substitute for complexity which allows for interpretations, using knowledge and experiences from other areas. Thus, through substitution, the metaphor creates new meanings, perspectives and even new and innovative ways of understanding.

5.3. Ethics and Social Impact (values)

One of the main traits of metaphors is that they emphasize certain aspects while obscuring others. Using anthropomorphising metaphors in AI terminology, does indeed create understandable meaning potentials between human intelligence and artificial intelligence. It can thus make AI systems more familiar and even less threatening. However, this can also lead to unrealistic expectations about AI capabilities; for example that AI exhibits the same intelligent behaviour as humans. If humans consider AI a threat, then AI presumably considers humans as a threat, leading to visions of doomsday scenarios such as "the singularity" – the self-aware artificial intelligence. By endowing AI with a terminology traditionally associated with life and human intelligence, it is inadvertently suggested that AI systems possess greater autonomy and moral status that they actually do, and that algorithms and data pools are not unbiased (Crawford 2021; Noble 2018; O'Neil 2017). Thus, algorithms tend to be saturated in Western values and based on accessible data. The belief that AI systems are autonomous systems capable of neutral and unbiased decision-making is highly problematic, because AI algorithms operate restricted by their pre-defined parameters and the data they are trained on.

6. Final Remarks

The "blue brain metaphor" (in its different variations) is part of contemporary foundational imagery for AI. That is, the metaphor has become deeply established and is widely used in visual public discourse by a number of (rather) different addressers (e.g., organisations, policy makers, tech firms, educational institutions, media companies etc.) – looking at AI from different perspectives having different communicative purposes. The "blue brain metaphor" for AI is clearly related to the (primarily) verbal metaphor "the computer is a brain". It may also tap into the already established (conventionalised) meanings of this (older) metaphor also having the possibility of expanding its meaning potentials as AI evolves as a performing technology. The "blue brain metaphor" for AI can do this because it is a function of an "Econian" semiosic logic. In this logic, a socio-cultural encyclopaedia

(potentially) decides which relations of similarity (based on interpretants) between AI and the human brain make sense. This concerns how, for example, AI is similar to the human brain (epistemologically speaking), and why (concerning normativity) – AI is able to learn. Ergo does it think. The development of brain-like characteristics (similarities) on the part of AI involves extraordinary socio-technical opportunities for humanity. The "blue brain metaphor" for AI can be said to be both trivial (not creative) and open towards new interpretations. On the one hand, its semiotics relates to the already established meanings of "the computer is a brain" metaphor and on the other hand, it seems to have a potentiality to drive very diverse interpretations on AI: from overly optimistic hopes, we postulate, to extremely pessimistic anxieties. This is perhaps, almost, the same as saying, that the "blue brain metaphor" (at least in relation to the perceptions of the general public) (almost) begets over-interpretations. Some commentators have, perhaps therefore, also criticised the "blue brain metaphor" calling it misleading (Wallenborn 2022), while others warn that there is no single metaphor which can capture the complexities of AI (Barak 2023)[2] – including the "blue brain metaphor" we will add. Finally, there will be, of course, a great difference between the ways in which a neuroscientist and a lay person could interpret the "blue brain metaphor" for AI (Baria & Cross 2021). However, both will be involved in the ongoing semiosis concerning AI of the socio-cultural encyclopaedia, where it is decided what relations of similarity make sense – when talking and visually communicating about AI and the human brain.

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CONCEPTUALIZING VISUAL METAPHORS IN HIGH TECH PRODUCTS ADVERTISING: RESULTS AND CONCLUSIONS FROM AN EMPIRICAL RESEARCH

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Abstract

The use of visual metaphors is a popular method of advertising nowadays. This paper briefly reviews the theoretical framework of metaphorical expression in advertising, and particularly the use of visual metaphors. It then continues with presenting results and findings from an empirical study on the use of visual metaphors in the ads of high-tech products. Given the nature of metaphors, the analysis is based on both qualitative and quantitative readings of the data, in order to reach more insightful conclusions. Based on the research findings and following the theoretical introduction, the paper concludes with implications and guidelines for the marketing utility of exploring the meaning and other features of visual metaphors.

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Keywords: advertising, visual metaphors, abstract metaphors, high tech products, interpretation, understanding, meaning, elicitation, qualitative and quantitative research

The Use of Visual Metaphors in Advertising

The use of visual metaphors in advertising is an essential feature of contemporary marketing (McQuarrie & Mick 1999). This approach of advertising is very popular in a range of industries, including the Fast-moving consumer goods (FMCG), Cosmetics, Information technologies (IT), Automotive and others, representing the largest advertisers in the world (Sakr 2016; Statista 2021). Metaphors have the ability to evoke associations as well as to transfer symbolic meanings to brands (Dehay & Landwehr 2019). Advertisers look for tools that can influence consumers' thoughts, and thus, they use metaphorical advertising as a means of constructing and maintaining desired perceptions (Philips & McQuarrie 2009) and image of the brand. The use of metaphors and above all visual ones is a strong way for consumers to experience the brand scientifically and emotionally. The emotional benefits are those that have a leading influence on consumer's behavior (Min & Kim 2018). The visual metaphor is highly valued for its capabilities to create positive feelings such as enjoyment (Morgan & Reichert 1999), which occur especially at the moment of finding the meaning and making inferences (Dehay & Landwehr 2019). To these theoretical findings we can also add that the visual metaphors primarily attract through their creativity and originality. It is this effect that is the first step to the success of an advertisement.

Some authors define metaphoric advertisement as a bridge in relationships building between the consumer and the brand (Hawkins 1975).

According to Nielsen, a leading company for market research (ESOMAR 2023), as well as other sources that study consumer attitudes and behavior, effective ads should meet the following four critical dimensions: Empathy, Persuasion, Impact and Communication. They jointly make up compose the so-called EPIC model (Nielsen, Putra, and Lisdayanti 2020). What does each dimension stand for?

Empathy: refers to the ability of the ad to create an emotional connection between the consumer and the product, the extent to which the ad makes the consumer to see themselves in the situation or characters depicted.

Persuasion: refers to the change in a consumer's trust, attitude, and desire to act, to ultimately be willing to purchase the advertised product.

Impact: relates to product knowledge, the extent to which advertising supports and enhances consumer knowledge of the product.

Communication: relates to the main message in the advertisement, how well it is understood, remembered, and perceived as a strong message.

Visual metaphors are a strong method of advertising that can influence the high performance of the ad by each of the four critical (as well as other) dimensions of ad effectiveness. The reviewed literature on the topic shows that persuasion as a dimension and pursued effect of the metaphorical advertisement is a very frequent topic of study. Other dimensions, however, are less frequently or secondarily explored.

Metaphors are defined as "particularly persuasive tools" that can influence consumer thinking and communication (Morris & Waldman 2011). The strength of persuasion may depend on the creativeness of the visual design of the latter stimulates the emotional experience among consumers. An effective design provokes curiosity about novelty, about the new phenomenon depicted and interest in decoding what the advertisement says. In order to elicit meaning, imagination needs to be intensified (Morris & Waldman 2011). The result of this mental process suggests that the ad would be remembered (Min & Kim 2018).

Two types of visual metaphors are defined: concrete and abstract. The concrete metaphors are directly connected to the product characteristics, and can therefore be clearly identified by users. In contrast to concrete metaphors, abstract ones create an indirect link to the product characteristics, making them more difficult to identify. The novelty of the visual is contained in the abstract metaphors. Not all metaphorical creations can increase persuasion (Siltanen 1981). Most of all, this is a quality of the truly creative abstract metaphors. Their interpretation and understanding may vary from consumer to consumer (Morgan & Reichert 1999). Also, one consumer may elicit more than one meaning from the new phenomena, which, at the best way, can strengthen curiosity about the product (Min & Kim 2018).

The essence of metaphor is to understand one concept in terms of another. Therefore, abstractions (Lakoff & Johnson 1980), A means B (Min & Kim 2018), and the fact that it may or may not be properly understood, strongly suggest that the process of metaphorical advertising should be accompanied by research. It is highly recommended the ad be studied among target consumers before launch, in order to confirm or reject whether the metaphor is correctly interpreted, understood and well received. It should also be studied after the end of the campaign, in order to account, where necessary, for its effectiveness and impact on commercial results.

2. Findings from an Empirical Research: "Conceptualizing Visual Metaphors in High Tech Product Advertising"

Following are findings from a research project on understanding visual metaphors in High tech products advertising. This project was carried out in July 2023 by a team of graduate students from the South-East European Center for Semiotic Studies (SEECSS) at New Bulgarian University (NBU) for the XXVII EFSS' 2023 "Conceptualizing Digital Reality Through Metaphors: Semiotic and Interdisciplinary Perspectives".

2.1. Methodology of the Research Project

This entailed a quantitative survey, conducted through the method of online self-interviewing. Respondents in the study were citizens from Bulgaria, with no requirements in terms of place of residence. We covered males and females from the two generations Z and X, so the target group was represented by young and adult people. The study included two phases: Phase 1 – collection of metaphoric ad visuals from the IT industry, served for selection of ad visuals to be studied, and Phase 2 – the project phase itself. A structured questionnaire was applied composed of open and closed questions. Bearing in mind the subject of study – metaphors, open questions were emphasized. Reached sample size: n=301 completed interviews.

Studied metaphoric ad visuals:

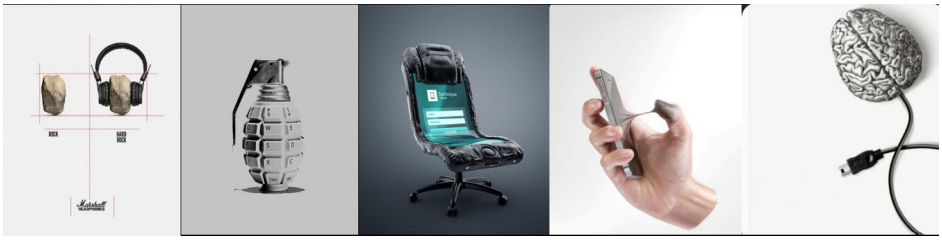


Image 1: From left to right, advertisement on 1. Headphones, 2. Digital security, 3. Bank services, 4. Mobile devices, and 5. Computer technique

The visuals were shown without the marketing messages. They represented different sub-industries: Audio, Cyber security, Financial services, Telecommunications and Computer peripheral. In addition to the different industries, another selection criterion was the level of complexity of the metaphor to provide both simpler and more complex abstractions. Our understanding and hypothesis is that metaphors used in ads for banking services and smartphones would be easier for consumers to interpret and understand than those used in ads for headphones, digital security and computer technique which we define as more abstract.

2.2. Findings

The current analytical approach involves both qualitative and quantitative reading of the data. The qualitative reading is based on the asked open questions, and it aims to explore the diversity and depth of interpreted meanings of visual metaphors. This is implemented through detailed coding of the open-ended questions and visualization of the results, inspired by the ZMET (Zaltman Metaphor Elicitation Technique) mapping and collage creation technique (Zaltman 2008; Zaltman 1997). The quantitative reading is based on closed questions and aims to measure two main aspects: whether or not respondents understand the meaning of the metaphors and ranking of the interpreted meanings. The data were processed with the statistical software SPSS.

Respondents' statement if they understood or not the studied visual metaphors.

Asked directly whether or not they understandood each image (showed monadically), significant shares of respondents answered that they did not understand the meaning of the respective visual metaphor. Ranging from 41% for the headphones ads to 64% for the computer technology ads, we find it a worryingly high percentage for the effective performance even for the ad with the lowest share of misunderstanding.

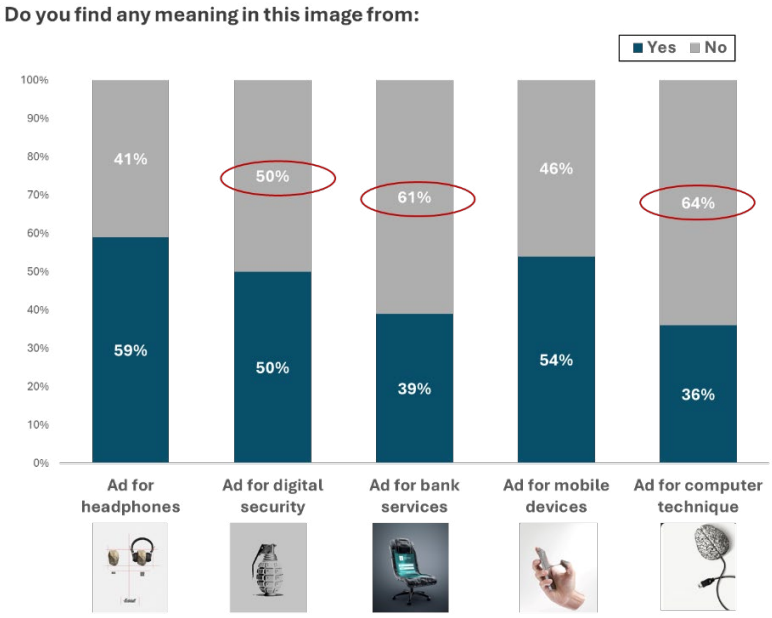
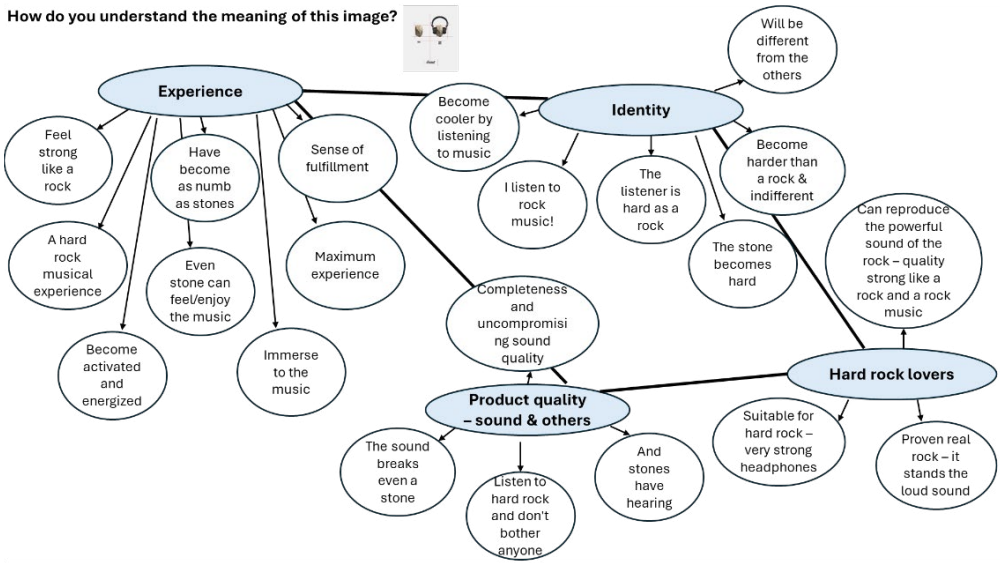


Figure 1: Question answers: Do you find any meaning in this image from …?

Understanding the meaning of the visual metaphor for the headphones ad

Respondents made a lot of interpretations of the headphone metaphor. The range was spread among the four categories: "Experience", "Identity", "Product quality" and "Hard rock lovers", with the greater variety relating to "Experience" and "Identity". The elicited meanings include interpretations such as: Feel strong like a rock, Even a stone can feel/ enjoy the music, The listener hard as a rock, The sound breaks even a stone, Headphones for a maximum experience, and Become activated and energized. The measuring of these results reveals that over ½ declare that they find meaning in the studied image. Nevertheless, their answers appear to be rather unrelated or incorrect to the image. Among the remaining respondents and answers, 52% relate the image to Headphones for listening to hard rock music (powerful, don't bother anyone, for true rock fans), while the next more frequent shares are assigned to High quality headphones with 23% (sturdy, qualitative sound, god bass) and How these headphones make me feel with 14% (strong as a rock, fill a lack in you, energized).



Map 1: Elicited meanings of the visual metaphor for the headphones ad. Based on the question: How do you understand the meaning of this image? Asked of respondents who declared that they found meaning in the image of the headphones ad

Collage 1: Visualization of elicited meanings of the visual metaphor for the headphones ad

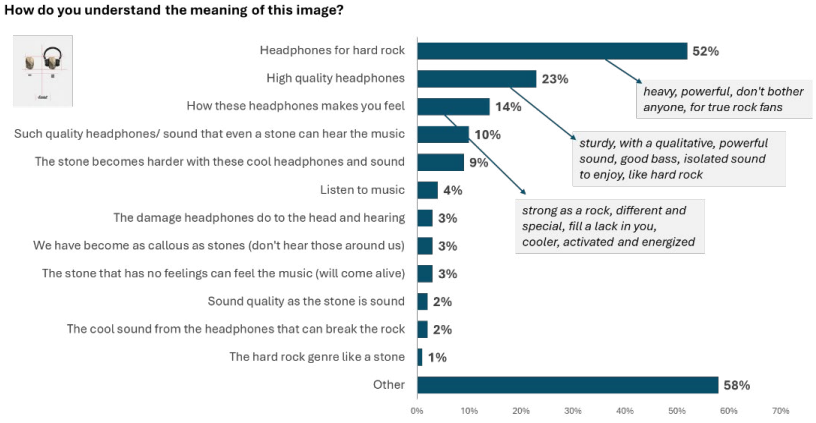
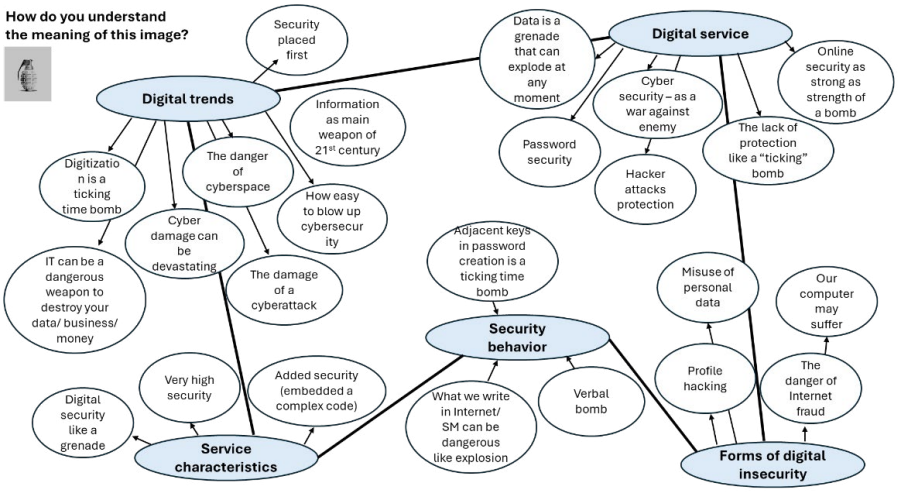


Figure 2: Quantification of elicited meanings of the visual metaphor for the headphones ad

Understanding the meaning of the visual metaphor for the digital security ad

Regarding the metaphor related to digital security visual, the respondents admitted even more interpretations. These can be classified in the four categories: "Digital trends", "Digital service", "Service characteristics", "Security behavior" and "Forms of digital insecurity". Most of them refer to "Digital trends", such as Information as a main weapon of 21st century, and examples from the other groups are Digital security like a grenade, The danger of internet fraud, Online security as strength of a bomb. The quantified results show that a very high share of 46% elicit the meaning of

Internet can be dangerous, if we are not cautious (pages we visit, what we speak). Many other interpretations reach appreciable shares, but most of all, these are Cyber security with 33% and Digitalization is like a (ticking time) bomb with 23%.



Map 2: Elicited meanings of the visual metaphor for the digital security ad

Based on the question: How do you understand the meaning of this image? Asked of respondents who declared that they found meaning in the image of the digital security ad.

Collage 2: Visualization of elicited meanings of the visual metaphor for the digital security ad

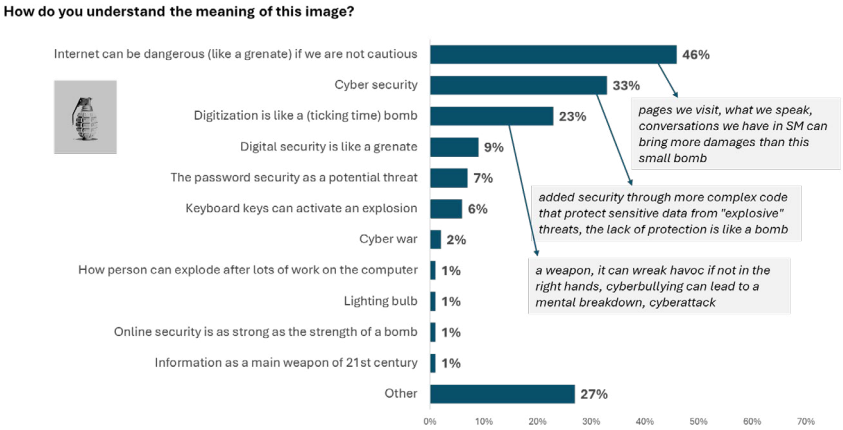
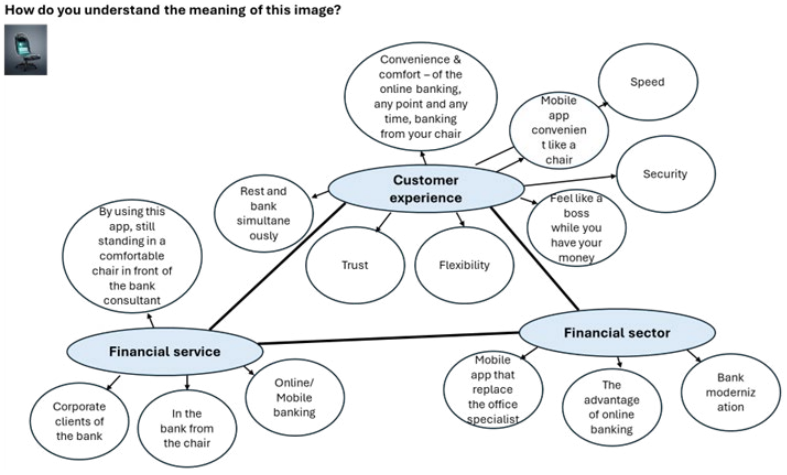


Figure 3: Quantification of elicited meanings of the visual metaphor for the digital security ad

Understanding the meaning of the visual metaphor for bank services ad

For the bank service metaphor, the respondents made relatively fewer elicitations. These can be grouped into three categories: "Customer experience", "Financial service" and "Financial sector", with most understandings concentrated in the "Customer experience" category. The meaning of this metaphor is understood as Convenience, Flexibility, Banking from your chair, Resting and banking simultaneously, and others. We find that the quantitative results are consistent with the qualitative, as all 81% elicit the meaning of Convenience of the online banking through a mobile app explained by examples such as banking anytime and from anywhere, while you rest you can bank, no need to go to the bank, and others.



Map 3: Elicited meanings of the visual metaphor for the bank services ad

Based on the question: How do you understand the meaning of this image? Asked of respondents who declared that they found meaning in the image of the bank services ad.

Collage 3: Visualization of elicited meanings of the visual metaphor for the bank services ad

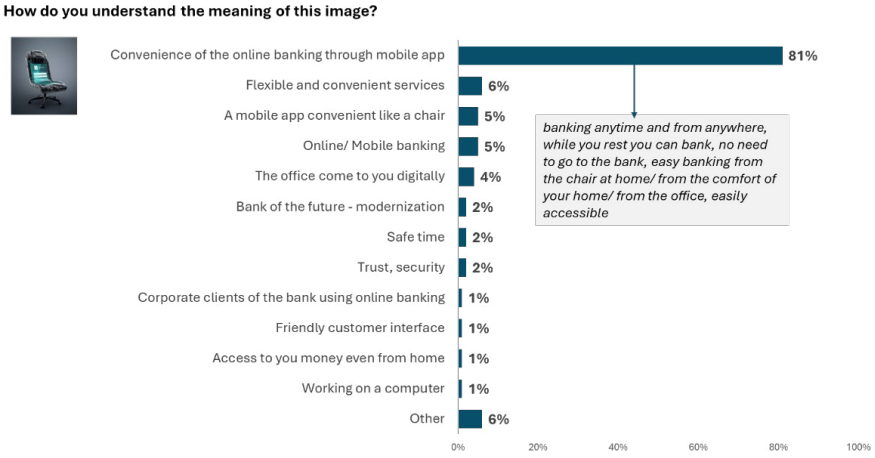
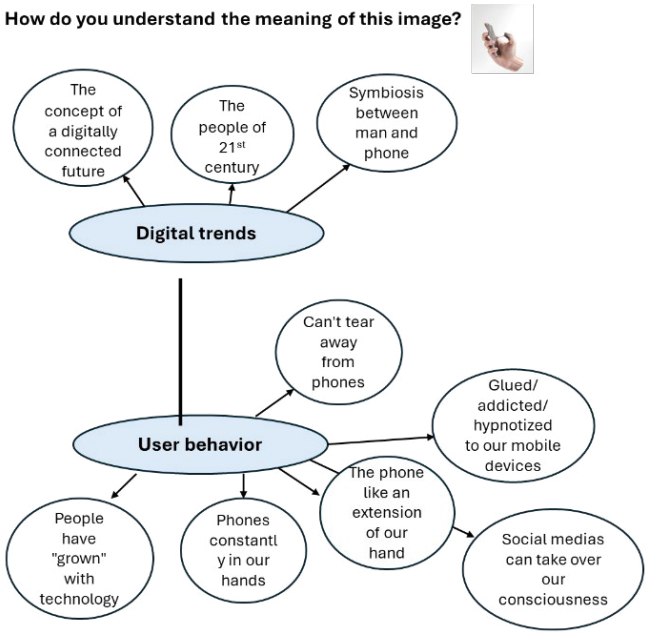


Figure 4: Quantification of elicited meanings of the visual metaphor for the bank services ad

Understanding the meaning of the visual metaphor for mobile devices ad

Compared to the previous metaphor, there are even fewer assumptions about the mobile device metaphor. The only two groups explored are: "Digital trends" and "User behavior". The meaning, embedded in this metaphor is understood as Addiction, Human-phone symbiosis, The phone like an extension of our hand, and some others. The quantitative dimension of the results shows the same – an extreme concentration in terms of perceptions of being addicted (71%), glued (59%) and also dependent (16%) on smartphones and offerings such as social media.



Map 4: Elicited meanings of the visual metaphor for the mobile devices ad

Based on the question: How do you understand the meaning of this image? Asked of respondents who declared that they found meaning in the image of the mobile devices ad.

Collage 4: Visualization of elicited meanings of the visual metaphor for the mobile devices ad

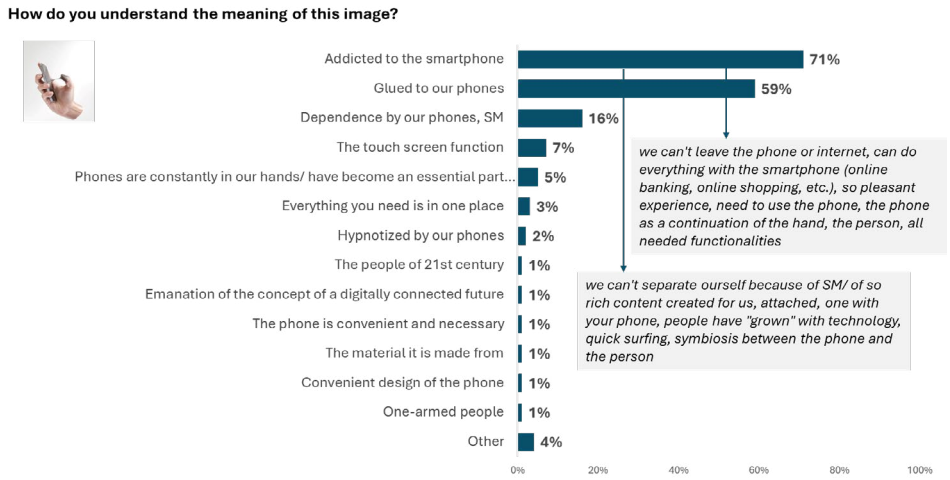
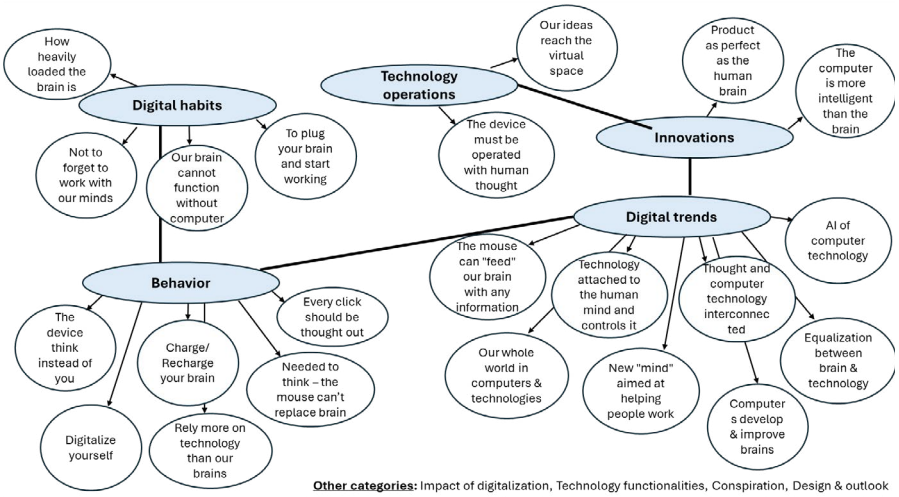


Figure 5: Quantification of elicited meanings of the visual metaphor for the mobile devices ad

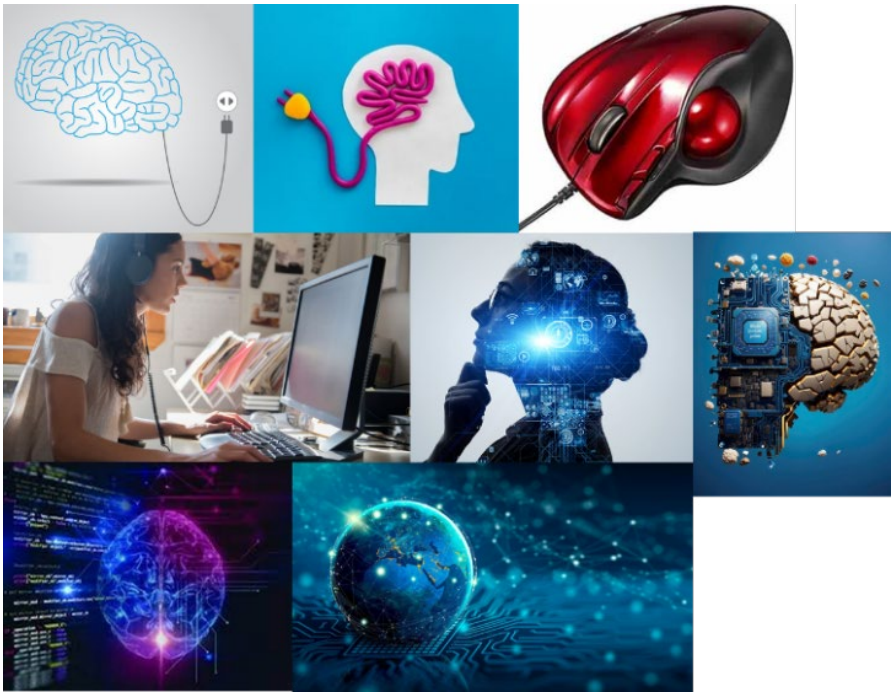
Understanding the meaning of the visual metaphor for computer technology ad

Together with the metaphor of digital security, that of computer periphery receives most interpretations of its meaning. The given assumptions are spread over at least five categories: "Digital habits", "Behavior", "Technology operations", "Digital trends", "Innovations", and others. A wide range of understandings of "Digital trends" as well as "Behavior" was registered. Some inventive answers are: Let's plug your brain and start working, Charging thoughts, Product as perfect as the human brain and so on. The quantitative reading of the data points to the most common understandings of this metaphor as Charging brain/thought (25%), which explained by instances such as the opportunity to acquire lots of knowledge from the Internet, computers develop/ enrich our minds and we become part of the net. In line with the diversity of categories and individual interpretations found, three more interpretations of meaning follow with significant shares: Our mind is connected to the technique (16%) – interpreted negatively as controlled, cannot work without it, and depend on technology in order to start working, Digitalization of human's thoughts (13%) and Smart/ innovative technique (13%).



Map 5: Elicited meanings of the visual metaphor for the computer technique ad

Based on the question: How do you understand the meaning of this image? Asked of respondents who declared that they found meaning in the image of the computer technique ad.



Collage 5: Visualization of elicited meanings of the visual metaphor for the computer technique ad

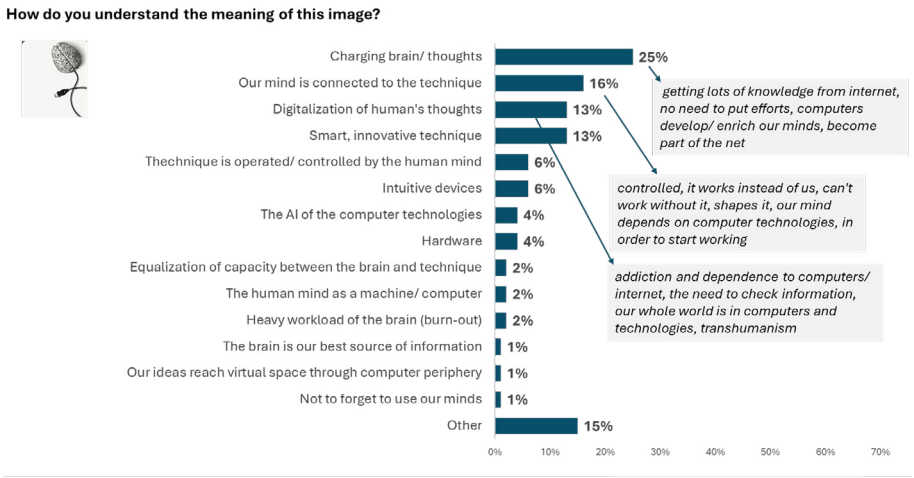


Figure 6: Quantification of elicited meanings of the visual metaphor for the computer technique ad

Conclusions and Directions

Based on the findings of the empirical study and the theoretical introduction on the use of metaphors, we reach the following conclusions:

1. Developing and launching an advertising campaign based on a visual metaphor strictly requires the inclusion of research among target consumers as part of the overall campaign program. In this way, the marketeers will have clarity on whether and how consumers understand the embeded metaphor. This is necessary because, on the one hand, the survey indicated that a high proportion of respondents do not understand the relevant metaphor (from 41% to 64% among the different metaphors) while, on the other hand, make multiple interpretations that may not always be correct and coincide with the meaning intended by marketing experts. A comprehensive understanding of advertising can influence its performance across all dimensions of the EPIC model (Empathy, Persuasion, Impact and Communication), as well as other metrics, confirming the usefulness of consumer research.
2. The value of research is especially important for the abstract metaphors which contain more complex creative designs and require more imagination to interpret. The hypothesis that metaphors about headphones, digital security and computer technology would be more difficult to understand was generally confirmed, since these were the visions for which the most categories of meaning were

identified, and the highest proportions of undefined responses were recorded.

3. In fact, research on visual metaphors is proving to be a rich source of brand associations. This is evidenced by the fact that for ads using abstract metaphors, respondents gave numerous suggestions about the meaning of the metaphors. Therefore, findings from this type of study can serve a great deal in building and managing brand personality and positioning in the marketplace.
4. Our survey did not include a direct technique of studying the emotional experience with the brand through its metaphoric explanation. However, based on the great activity of people to provide their understandings of the examined metaphors (for example, some respondents provided detailed answers, although these were not expected), we can infer that the use of metaphors does affect consumers emotionally by creating positive feeling such as curiosity, enthusiasm, and enjoyment.
5. Metaphoric understanding may vary according to the socio-demographic profile of respondents. Although we do not have specific data from the current research to prove it, we believe that understandings may differ depending based on respondents age, place of living, and degree of familiarity with high tech products. In this regard, users of a higher age (45–50 + years) who do not live in cities and are not too familiar with advanced technologies and trends in this industry, would face difficulties in interpreting abstract metaphors. Therefor, and in line with the targeted group, marketeers may consider differences based on socio-demographic characteristics.

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GENERATIVE MEDIA: SIGN, METAPHOR, AND EXPERIENCE

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Abstract

This article explores the vivid field of generative media, focusing on the production and semiotic analysis of texts. It uses the broad definition of "text," which encompasses written, visual, and interactive forms, and examines how generative media redefines the roles of content creators and tools. Utilizing Roman Jakobson's communication model, the article highlights the dynamic decision-making process in text production, whether by human or AI. The paper offers a historical review which traces generative media from early computer art in the 1960s, through the advent of digital design tools in the 1980s and 1990s, to contemporary AI techniques like GANs and diffusion models. It identifies the key properties of generative media: synthetic, dynamic, digital, combinatorial, and agentic. The discussion also addresses the shift from unnoticed AI assistance in early tools to the inadvertently AI-generated content in today's media landscape. The last part of the paper categorizes generative media interfaces into three

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types: conversational, web UI, and visual programming interfaces, analyzing their semiotic implications. It suggests that understanding these tools requires recognizing their layered technical components and the evolving user experience from magic-like simplicity to complex customization. In conclusion, the articles advocates for a multidisciplinary, process-oriented approach to fully grasp the cultural and communicative transformations driven by generative media, emphasizing the importance of transparency and user agency in AI interactions.

Keywords: generative media, generative AI, user interface, material semiotics, digital semiotics

Introduction

The recent explosion of generative media has attracted a plethora of users from all domains and disciplines. The unrestricted access in form of conversational bots to DALL·E and ChatGPT by OpenAI – in September and November 2022 respectively – proved that high quality content can be generated easily by anyone with a web browser. Many discussions around generative images, generative text, and generative media in general, place the accent on the content generated itself and its potential uses.

This article situates itself at the production stage of texts. A text is understood here in its broadest sense; as a series of syntactic, semantic, and pragmatical traits which cooperate together in the meaning making of instances. In this respect, the distinction between media supports - such as written text, speech, visual images, sounds, video, interactive works - will be useful only in respect to the material form of texts, not to their narrative and discursive content.

In order to produce a text, a sender has to take some decisions first. Following the well-known typology of linguist Roman Jakobson, the text can emphasize its origin, the receiver, the channel, the context, the message itself, or the metalanguage attributes (colours, forms, shapes, materials). In a scenario which considers generative media, the sender has the choice to address explicitly one of those elements, but also to delegate such will to the software program.

The questions which drive this contribution emerge from software artefacts where the capacity of generating texts predominate. How do they enhance or obfuscate the production of texts? What is the communicational relationship between a tool and its user? How can semiotics help to better understand the meaningful dialogues and exchanges which occur between sender and artefact to produce a text?

In the first part of the article, we review the notion of generative media from a historical perspective, especially in relation to the field of digital art, where it has found valuable exponents and perspectives. Then, we analyze current software applications for generative media from a semiotic standpoint. We focus on three types of interfaces: conversational interfaces, web user interfaces, and visual programming interfaces. We demonstrate a correlation of semiotic mechanisms available for each type of interface. While the entry-level is more natural language-based, the complexity of adjusting the capacities of the software become more visible at the mid and advanced levels. This is not surprising according to the levels of description following a semiotic trajectory (Reyes 2017). However, it is interesting to evoke the renewed metaphors and the acts of translation operating at the heart of these artefacts. In the last part, we offer our concluding remarks.

Understanding Generative Media

On the occasion of the 27th Summer School of Semiotics (Sozopol, September 2023), we insisted that current generative media meet five properties. First, it is synthetic in the sense that it is built artificially. Second, it is dynamic which means built on demand. Third, it is digital, i.e. built with computing techniques. Four, it has endless versions which emerge from connecting basic units in infinite combinations. Five, it has agency, from the perspective of reacting to the user input, like a dialogue between human and a multiplicity of artificial agents.

Levels of generation

Since the introduction of computer-assisted design and media software tools in the 1980s, users and media creators have been using AI-assisted technologies, sometimes in an unnoticed manner. For example, the popular "magic wand" tool introduced in Photoshop 1.0 (1989) allowed parts of an image to be selected based on regions of colours. Although the process of selecting regions relied more on image analysis than on AI techniques, the idea was to perform ,"magic" on images. The adjective magic was also present in another tool, the magic eraser, which allowed selected pixels to be converted to transparent upon clicking.

Another example of everyday content generation can be seen in web browsers. The list of links that appear when users launch a request is called dynamic content. In early search engines, such as Lycos and Yahoo, the results tended to be similar across computers, but today the links may vary depending on the geographical context, the user navigation history, and other non-visible information exchanges between web services (you can

try the add-on Lightbeam for Firefox to have a glance at those information exchanges). More recently, generative content has taken on the form of recommendations. We see suggested artists and playlist in Spotify, as well as films and videos based on our watching activity on YouTube and Netflix. E-mail clients such as Gmail also generate suggested text as we start typing a new email.

While software users may have not noticed that some of their tools were based on AI, today we consume content without any certainty that it has been generated by AI. Also since the 1980s, computer graphics techniques such as noise algorithms have been used, in order to create "very convincing representations of clouds, fire, water, stars, marble, wood, rock, soap films and crystal" (Perlin 1985). This means that instead of modelling a 3D model or a particle system requiring high amounts of computing power to render, the picture is a 2D image that generates only when needed. In our present time, the same could be said of backgrounds (matte painting), crowd masses, digital actors, prompts, assets, lights, scenes, voices, music, and editing.

A brief history of generative media

The term generative media can be traced back to a time before the introduction of cultural computing in the 1980s and 1990s (Manovich 2013). In the 1950s, early adopters of the term began doing artworks in form of images, films, kinetic sculptures, music, and literature.

Cybernetics is a starting point common to the variety of approaches. Inaugurated by the mathematician Norbert Wiener in 1948, cybernetics is a field dealing with control mechanisms within all types of systems, whether composed of similar, varied or hybrid entities. These control mechanisms are understood in terms of the relationships between components and the type of energy and information they exchange. For Wiener, an important aspect in this process was the external context of the systems. When notions like structure, process, and quantification were later applied in computing systems, they found a representation in visible form.

The impact of cybernetics in generative media was materialized in the 1960s. What is perhaps the first exhibition of computer art, entitled "Generative Computergraphik", was organized in Stuttgart in 1965. It included artworks by early practitioner Georg Ness. Later that year, artist Frieder Nake was also part of the program. At that moment, the word "generative" was associated to "art that was produced from a computer program and, hence, was at least in part produced automatically" (Boden & Edmonds 2009: 23). Generative art referred to "the activation of a set of rules (…) where the

artist lets a computer system take over at least some of the decision-making (although, of course, the artist determines the rules)" (Boden & Edmonds 2009:24). In this respect, other artists in the 1960s employed different terms to characterize their work: Manfred Mohr, called it "generative art", Max Bense "generative aesthetics", and Jack Burnham "process art".

Moving forward in time, in the late 1990s, the term recovered an invigorating momentum. After the explosion of media software such as Illustrator (1987), Director (1988), Photoshop (1989), After Effects (1993), 3D Studio Max (1996), or Maya (1998), artists and designers embraced the use of programming code. The term "generative design" is directly related to 2D and 3D graphics produced with code, rules, and grammars. The application Design By Numbers (DBN), created by scholar and designer John Maeda at MIT, inspired the development of a series of software in generative media: Processing (2001), DesignRobots (2003), NodeBox (2004), ContextFree (2005), and Structure Synth (2007). As we can see, in addition to generated output, a strong importance was placed on the processes, instructions, and computing methods conceived by the producer.

The following trend in our brief account involves AI techniques. In general, AI requires that the analogies between living systems and machines be looked at. An example is the image of artificial neural networks assimilated to an image of the human brain. Other specialized developments include agents, complex systems, artificial life (A-life), and genetic algorithms. An attempt to elaborate a definition of generative art which also includes AI was first proposed by scholar Philip Galanter in 2003 (refined in 2008 and republished in 2016): "Generative art refers to any art practice in which the artist cedes control to a system with functional autonomy that contributes to, or results in, a completed work of art. Systems may include natural language instructions, biological or chemical processes, computer programs, machines, self-organizing materials, mathematical operations, and other procedural inventions" (Galanter 2016: 154).

With AI and machine learning techniques, the term "generative" is used with a more technical background. For instance, the popular Generative Adversarial Networks (GANs) were introduced in a paper in 2014 to describes generative models and generators. Well-known artists such as Refik Anadol, Mario Klingemann, Trevor Paglen, and Memo Akten adopted GANs, in order to create images and films. Further advances in image synthesis have led to StyleGAN and diffusion models which have been implemented in popular tools such as Midjourney. Today, it is claimed that 34 million images are generated daily by all kinds of users across all AI services and platforms (Valyaeva 2023). Hence, the notion of "generative

AI" has gained attention, since it encompasses the capability of producing high-quality results out of endless connections and possibilities of the data that has been fed to the model.

Meanings of generative media

Throughout the history of generative art, artists and designers have reflected on the use of computing techniques to create their works. Broadly speaking, the computer has helped to better understand their own artistic practice and to think differently the expressive message to convey.

While computers and networks are becoming increasingly complex and distributed environments to create artworks, one of the first and most important contributions was the programming and generative possibility of computing systems. Early adopters such as Vera Molnar, Ernest Edmonds, and Frieder Nake created their own software procedures using the programming language Fortran. It was a novel perspective to consider an artwork as determined by its endless variations: the combination and recursion of visual parameters and, its responsiveness to the public or to external events occurring in the spatial context (changes in the temperature, the light, the heat, the amount of people in the room). Moreover, computing behaviours were also associated with cultural values. For example, "randomness", which basically adds a disordered series of events and numbers to a program, for an artist it was also seen as "chaotic" (Molnar), "indeterminate" (Edmonds), and "unpredictable" (Nake).

Returning to Jakobson's work, it is possible to locate meaning intentions at the level of each component of the communicational typology. On the side of the "sender" (i.e. the artist using digital tools), the intentions have been to "stretch the imagination, expand consciousness, and inspire others to new levels of creativity and invention" (Shanken 2009:15). With regard to the "context", artists are sensitive to the world they live in, criticizing the effect of technologies in culture and society. The "channel" (networks and media artefacts) is often repurposed for the sake of motivating strong aesthetic experiences. The "receiver" is the main goal to be reached, the observer to be seduced, the player to be touched, the visitor to be captivated, and the mind to be baffled.

Within a generative context, the originality of the artwork resides beyond a final outcome. Not only can variations be endless, but digital practices such as remix, glitch, and fork also make explicit the possibility of reusing materials to create further versions. Taking a look at generative art enables us to recall the importance of processes and procedural systems. In these terms, the meaning of writing procedures is to enforce "rules to gen-

erate some kind of representation, rather than authoring the representation itself" (Bogost 2007).

As already mentioned, early adopters had to made interventions at the level of the programming language, in order to express their visions. Adopting code as creative tool and choosing a programming language are choices related to questions of budget, platforms, and operating systems, but they are also a subjective decision. They influence what can be done and how easy or difficult it is to do it. In other words, they have the potential to frame a way of thinking. For our current discussion, we will suggest that the syntax of programming instructions may be somehow related to the syntax of prompts as they exist in recent generative AI services. Prompts have become a valuable asset in the production of generative media. We recently talked about prompt engineering, prompt programming, prompt design, and prompt modifiers. Despite the fact that one of the critiques that can be made to text-based prompting techniques is the necessity to use natural language to describe a desired output, the environment is based precisely on Large Language Models (LLM) and Natural Language Processing (NLP) techniques, in order to analyze and interpret text sequences. As we will explore, there are of course Large Visual Models (LVM) that can be used for different tasks and scenarios (Bommasani 2021). There is also a series of transformations which can be used to encode and decode text, and to align it to images and other media formats.

Semiotics of Generative Media

In this paper, we have made reference to cultural software which became predominant in the 1980s. We also mentioned web-based trends and quickly alluded to programming languages. In this section, our intention is to continue an exploration of tools for generative media. We ask the following questions: How are generative media created? Which software tools? Can we identify trends? What is the impact of such tools at the social and cultural levels? In our view, the transformation of a tool into a media involves the action of meaning-making processes that fall within the scope and import of semiotics. We relate three kinds of user interface to three levels of meaning implication with the tool, that is, generative media as sign, as metaphor, and as experience.

Digital tools for generative media

Well before the arrival of computers, artists and designers were well acquainted with random values and chance. Various artists in the abstract, conceptual, and contemporary movements employed dices, for example, in order to obtain aleatory results which were then translated into the artwork

proper. Stimuli from the environment were also a source of generating noise and new values (blowing wind, flowing water, animal movements). For our purposes, it will important to say that stochastic methods and other numerical techniques are considered digital tools when the internal system of a computer enables the translation of analogue signals into binary information.

The historical recollection presented in this paper has also a more technical approach which clarifies the relationship between software and hardware. To give an example, among the several programming languages used by renowned artist Frieder Nake in his career, ALGOL 60 served to create the custom drawing software Walk-through-Raster. In order to produce a visible picture, the procedure was tightly linked to a Graphomat Z64. Introduced by engineer Konrad Zuse in 1961, this machine was "an automatic drawing board that was controlled by punched cards" (Burbano & Garcia 2016). From this example, we want to make explicit several interconnected parts in the production of a generative artwork: a programming language, a software, punched cards, and a computer able to interpret them.

The further development of computing machinery led to what are known as compiler programs. Their aim is to translate instructions written in one programming language into assembly language. An assembly language is used for developing system software such as operating systems (OS), and it is specific to the type of hardware in the machine (for example, a certain kind of processor). An additional operation comes from the translation by assemblers into machine language or binary code. Although this description may sound far from the typical level of the users, the processes which occur below the interface are interrelated. We see their impact in form of incompatibility and obsolescence. Apple users, for example, noticed recently that some applications cannot be opened with the new Sonoma OS, since this is built for the new Silicon processors of the M series.

It can be said that such technical issues are hidden to common users thanks to software applications. Moreover, as the web becomes an increasingly powerful environment, browsers like Firefox and Chrome have become the main place where users access can share, store, and process information. Vendors using cloud services offer now online versions of their applications. We see an increasing number of online services which demand intense computing power not often available in local machines. In the following table, we summarize some of the most important components at different technical levels based on a web environment. For us, this account is important because the material levels determine different types of meaning implication.

Table 1: Material levels based on a web environment

Material levels	**Example of components**
Screen devices	Computer displays, tablets & smartphone screens
Screen objects	Media texts: visual text, visual images, videos… Graphical interface: windows, buttons, pointers…
Web development environment	Frameworks: React, Bootstrap… APIs: Google Maps, OpenWeatherMap… Libraries: Docker, Socket… Hubs: AWS, Github, Hugging Face…
Machine learning services	Models: LLMs, VLMs… Datasets Data Algorithms: sorting, search, hashing…
Middleware	Message Brokers, Databases, Servers, API Gateways…
Hardware	CPU, GPU, RAM, Hard Drive…

Levels of meaning

Starting from the definition of a sign in the Peircean tradition, it is well known that semiosis is the produce of three parts: the sign itself (representamen), the object, and the interpretant. Additionally, each part can be further described in three subparts, yielding to three trichotomies. In the second trichotomy, the signs in relation to its object, Peirce further elaborated a subtrichotomy for the icons, calling them hypoicons to signify that there is a substructure supporting an icon. Quoting Peirce: "Hypoicons may roughly /be/ divided according to the mode of Firstness which they partake. Those which partake of the simple qualities, are *images*; those which represent the relations, mainly dyadic, or so regarded, of the parts of one thing by analogous relations in their own parts, are *diagrams*; those which represent the representative character of a representamen by representing a parallelism in something else, are *metaphors*" (Peirce Edition Project 1998: 274). Figure 1 schematizes these 15 categories.

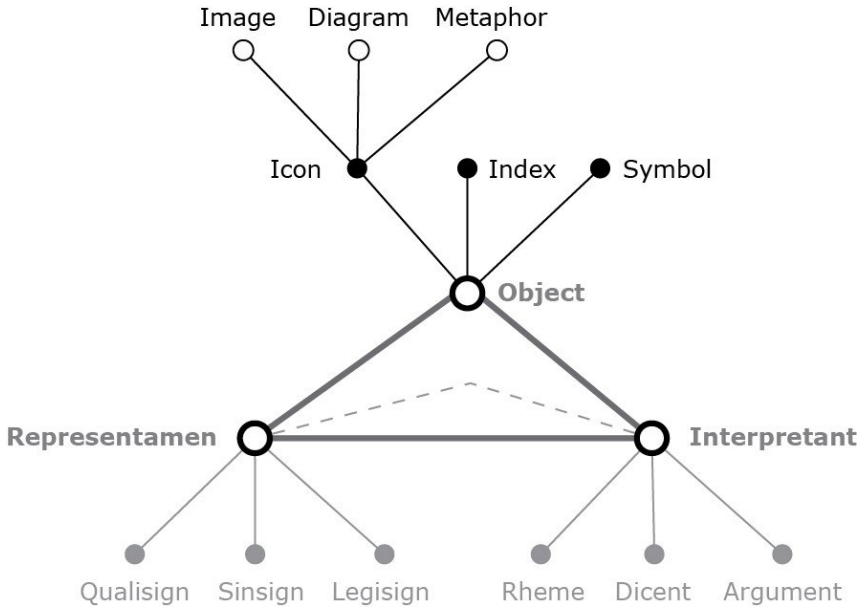

Figure 1: Peirce's trichotomies including 15 categories of signs

From this theoretical background, we can identify three levels of meaning implication in the production of generative texts with AI tools. From the perspective of the expression plane (i.e. the part of the meaning process that is perceptible), our levels go from computer signs (representamen), to digital metaphors (object), then to user experience (interpretant).

Concerning computer signs, they are the fundamental units of expression. They store bits in form of bytes, which then form data types (integers, strings, boolean). At a higher level, they can also be seen as arrangements which give form to building blocks (data structures, visual primitives, visual descriptors, interface elements).

Regarding digital metaphors, in terms of Peirce we consider them related to a subpart of iconic signs. In form of screen objects, they are configurations made out of the entities encountered at lower material levels (table 1). Thus, we talk about interface assemblies or configurations of interface elements. As such, they are described in terms of their constitutive parts: How are they made? How do they follow or challenge the expected experience of the user? How do they establish a communicative and semiotic relationship between human and non-human actors? This is paramount to us because screen objects host, locate, and define modalities of interaction: to believe, to do and to know (for an example of such modalities applied to face-recognition software, see Reyes 2021). Therefore, studying metaphors in the

digital domain requires not only an study of the material aspects of indexical icons (i.e. the graphical user interface), but also the conventions and ideologies that are evoked. Marianne Van den Boomen precisely situated discourse metaphors in the digital praxis (2014): more than just conceptual metaphors like cyberspace or electronic highway, discourse metaphors are also material metaphors in connection to technological artefacts (email, chatbots, generative AI tools). Metaphors reflect the pragmatical perspective of Peirce. They are active agents which bring something into being, rather than merely expressing a fixed idea for the sake of poetic or rhetorical effect. Similarly, Joanna Zylinska follows Matthew Cobb's suggestion that our scientific horizon depends on the technological metaphors we use at a given time. She goes further to ask: "Can we learn to see ourselves and our world better once we have changed our metaphors?" (Zylinska 2023: 151).

Finally, the experience level of meaning implication emphasizes the pragmatic aspect of the life of signs. Pierce claimed that once a sign spreads among the users, its meaning grows by use and experience. Scholar Thomas L. Short comments: "Experience thus leads to modifications of meaning. By unexpected consequences, good and bad, we learn more about what to expect from, or that can be done with, things of the type signified. Meaning is added to meaning" (Short 2007: 286). In our typology, experience enhances a mode of discovering, of learning, and making conclusions. In this respect, interface assemblies can be seen not only as interface features, but also as arguments, statements, and visions that reflect upon practices influenced by larger semiotic spheres, from artistic, educational and professional strategies, to digital culture and the digital way of life.

Generative media interfaces: three cases for analysis

Our typology of levels of meaning implication is derived from our own practice in the study of web-based tools and uses. In this part we have selected three cases for a semiotic analysis. Each case is associated to a level of meaning as shown in table 2. With this distinction that we do not claim a unique relationship between both sides. We rather sustain that these, and other levels of meaning, exist in a hierarchical mode. For our purposes, we believe that conversational interfaces, as they are ubiquitous in digital culture, simplify discussing the experience of a user that has access to a generative media tool like ChatGPT. However, a more knowledgeable user who dares to go further in the creation of generative texts, is rapidly confronted with environments like web user interfaces. Ultimately, it is also possible to discover more technical subtleties if a user unveils advanced tools where the computing signs can be manipulated with more flexibility.

Table 2: Cases and levels of meaning

Case study	**Level of meaning**
Conversational interface	Experience of users
Web user interfaces	Digital Metaphors
Visual programming interfaces	Computer Signs

Conversational interfaces

Conversational interfaces share similarities with prompt-based services. These are tools which accept the input of a user, commonly in form of natural-language text sequences. The output generated by the computer is in form of text or another media (as in text-to-image tools, for example).

Text-based and command-line interfaces (CLI) are in fact one of the first modes of human-computer interaction. They were introduced in the 1960s to replace punched cards. Today, we still use CLI every time we manage files or launch batch operations from the Terminal application in OSX, or with programming languages that include a CLI mode: Python, R, MATLAB, LISP.

However, the popularity of prompt-based interfaces is due to supporting a conversational scheme of communication. Conversation has the property of being "a context-dependent social activity that implies a potentially terrifying immediacy" (Hall 2018: 10). As one of the most important human activities, conversation as interface puts real-time and natural language interaction at the center of the design practice. We can see this characteristic in a prominent example already developed in the early years. The NLP (natural language processing) program ELIZA, developed by computer scientist Joseph Weizenbaum at MIT in 1964, consisted of a conversational interaction between a human user and a programmed simulated psychotherapist. Participants were immersed in the conversation partly because the systems was always available to interact.

Conversation has been present in chatrooms, email clients, games, SMS, and text messaging applications. In her study, designer Erika Hall (2018) makes the difference between texting and writing and how they define particular modes of conventions (the former being more informal, while the latter being more compositional). Typing can be seen as "fingered conversation". A similar trend is noted by computer scientist Jensen Huang (CEO of Nvidia), who sees the interaction with chatbots as an act of programming: "everybody can program ChatGPT… because human language, natural language, is the best programming language" (Huang 2023).

When features such as immediacy, real-time responses, ubiquity of access (mobile, web, desktop, sunglasses, IoT), permanent availability (anytime), language understanding (any topic, but also disregarding input errors or misformulations from the user), voice recognition, voice synthesis, are included in conversational interfaces targeted to general public, a commercial message is to think of the user experience as magic.

As we saw in previous sections, the adjective magic already existed in tools like the "magic wand" in late 1980s. Today, web apps and digital tools increasingly include the magic icon as a visual element that indicates the presence of AI-driven features, a special functionality meant to surprise and delight the user and to enhance the overall experience. The "magic wand" conveys broadly creation, transformation and content generation. Besides this indexical icon, we can cite others. The "sparkling pen" that stands for text generation or enhancement, the "starburst palette" that suggests artistic or design generation, the "glowing microphone" for AI-generated audio or voice content, and the "enchanted book" that represents AI-generated storytelling or content creation.

Web user interfaces

While using commercial generative AI tools might indeed feel like magic, the second type of interface we bring forward concerns the production of generative media with web-based UI tools. These tools confront the user with a more complex environment which offers the benefit of adjusting some parameters that exist under the hood of the magic hat. In this scenario of use, the role of the sender is typically played by a company, or a research team, or an educational group who wants to customize the predefined behaviour of a given solution. For example, it could be possible to design a tool with specific knowledge in a given discipline, or to integrate a different model, or training data. In such situations, the producer assembles the technical possibilities of the tool in form of a graphical interface and makes them available to its readers (members of the company, the research lab, or students in class, for example). We agree with scholar Peter Bøgh Andersen with regard to the role of the designer as sender of computer-based signs: "a designer is an indirect sender, creating the structure for processes in which the interface is manifested" (Bøgh 1997: 184).

Nowadays, graphical interfaces are seldom hard-coded. The common practice is to use a toolkit that puts together pre-defined groups of elements. Let us consider a popular open source framework like Bootstrap, originally developed by Twitter in 2011. It exploits style rules in CSS together with interactive events in JavaScript and offers various blocks of

containers, layouts, forms, and other components. In web environments, the HTML elements are ultimately consistent, i.e. input fields, buttons, text areas, while their appearance changes according to the framework in use. In this line, ChatGPT has never publicly detailed its framework; it rather evokes a combination of them: Tailwind CSS, React, and Bootstrap.

With the introduction of the web as platform, robust online development environments have appeared. From creative coding (e.g. p5.js) to machine learning (e.g. Jupyter), generative media interfaces can be designed directly on the web. In this domain, a well-know user-interface library is Gradio, established in 2019 as an open source project, then acquired by Hugging Face in 2022. As a Python library, Gradio can be used in other services such as Google Colab or Jupyter Notebooks.

A quick look at Gradio's rationale allows to see that its prebuilt interface components are specially configured for AI tasks that output the result in a web-supported media format (text, image, video, audio). Interface components are grouped in blocks that maintain a functional coherence, for example a text box and a button in the same bind convey interrelated functions. Gradio also dedicates a high-level component to create chatbots. The Gradio framework has gained popularity because it integrates an environment that allows to create, test, access, copy, and edit the source code, to share the interface, to test different models, and to store it free at Hugging Face. By June 2024, Hugging Face reported more than 500 thousand spaces created by the community of users. Moreover, besides LLM applications and conversational design, Gradio is extensibly used in LVM (Large Vision Models). To mention an example, Gradio is the framework used by Automatic 1111, the standard user interface for Stable Diffusion WebUI. Image generators are a case that challenges complex and customizable support for UI frameworks.

Overall, user interfaces for generative media adhere in part to the notion of visibility of the process. They show a combination of numeric values and technical vocabulary to have a glance at the variables that affect an output.

Visual programming interfaces

Our third case involves a closer interaction with computer signs. In this case, senders extend their role as producers, developers, designers, and creators of texts. Following the variety of material layers underlying a generative media process (table 1), a deeper involvement with computer signs adopts the principle that components can be considered as texts. This means that a sender is not only able to articulate prompts, but also user interfaces and potentially datasets, frameworks, models, and APIs.

In our view, one way to take a look at the manner in which the components of material layers are interrelated is to observe tools and environments which reflect the state of the program and the flows of data among its components. For this matter, visual programming interfaces provide a rich field of study. Indeed, visual representations have been of interest to computer scientists working on CGI, image processing, computer vision, and spatial hypertext. Common visual objects for visual programming include flowcharts, blocks, nodes, curves, and shapes that can be manipulated in two dimensions. In terms of their utility, many studies focus on their more natural way of interacting, especially for educational purposes (Jiang 2023): constructing instead of writing a program; drawing lines instead of typing coordinates. Other studies refer to their added value to specialized users: a visual program tends to be a higher-level description of more abstract processes difficult to see. Such a program could also present more information about the state, the variables, and data structures in use (Myers 1990).

As we recall from precedent sections, node-based tools became popular in the early 2000s. They appeared as stand-alone generative design applications (e.g. NodeBox in 2004), and as modules integrated in media software (e.g. Grasshopper for Rhino in 2007). Today, node-based programs remain widely used in the creative community (Pure Data, MAX/MSP, TouchDesigner, Blender Nodes, Unity VFX Graph, among many others). In its visual form, a program is diagram made of nodes interconnected with lines. Nodes and lines are graphical elements that can be used as visual variables (shapes, colours, position), representing meaningful computing concepts (classes, operations, relations, imbrications)

In the arena of generative AI, it is not surprising that text-to-image and image-to-image models, with their applications in design, illustration, creative imagery, and marketing, have adopted graphical programming techniques. While major services such Midjourney, Dall-E, Runway, or Leonardo AI propose a commercial, web-based, GUI-based environment, Stable Diffusion gained acceptance among the open source community when the company Stability AI released version 1 in Open RAIL license in 2022. Besides DreamStudio and Stable Assistant, two products commercialized by Stability AI, Stable Diffusion can be installed locally to generate unlimited numbers of workflows and images for free. As already mentioned, Automatic 1111 is a common GUI, but ComfyUI rapidly became the preferred interface to create complex workflows yet in the intuitive logic of visual programming.

To give an example, each box in ComfyUI represents a node. There are several categories of nodes: input nodes (text, images), processing nodes (KSampler, CLIP Text Encode), output nodes (Save image, Preview image), model nodes (Load Checkpoint), among others. The left and right sides of each node have one or more inlets and outlets. A user can draw a line from one inlet to an outlet. Lines have different colours depending on the data value. Furthermore, inside the box of each node, there is a list of parameters and values that can be adjusted. All these visual options have been customized to meet the machine learning routines. In the background, ComfyUI's interface is based on LiteGraph, a Javascript library to create graphs. Although ComfyUI is based on Python, it launches in a virtual server accessible from a web browser.

Routines constructed in ComfyUI can be saved and shared. They can be executed in the same way, on condition that all libraries and models exist in the local machine. This is important to note because users of this environment need to be well informed about deeper material layers. Installation requires instructions to be run in the command terminal but also to have modern GPU, CPU, RAM, OS, and disk space available (the size of the recently announced Stable Diffusion 3 is more than 20 GB including text encoders, which are used to manage the translation from text to image in the latent space).

Conclusion

In this paper we have explored generative media from different perspectives: as digital material, as meaning implication, and within a historical context that started in the 1960s, which has risen a series of interpretations and experiences. We adopted the point of view of the producer, i.e. the creator and sender of messages.

We criticized the idea of generative AI as magic, also reinforcing the notion of computer systems as a black box machine. At the present moment, one of the most advanced levels of user interaction in generative media implies to know exactly what is happening in the generation process. However, one difficulty which emerges when dealing with GPT models is their increasingly production of unexpected results. Computer scientist and author Ronald Kneusel has referred to some "happy accidents" that were not intended by the GPT-4 model but are nonetheless accurate (like generating computer code in a language that has little presence on the web) (Kneusel 2023).

Our contribution builds upon a material perspective of signs and cultural traces, and it calls for a multidisciplinary and experimental attitude, in order to grasp the complexity of digital reality and culture. We believe it

necessary to encroach upon the field of more specialized users, in order to acquire a more complete vision of digital culture. A process-oriented view is of particular help. It looks at software in connection with human learning and communication, and in relation to the use context: "system objects are seen as the expression plane of signs whose content is generated in the work context" (Bøgh 1997: 186). In an attempt to better understand interfaces, it seems productive to consider them as texts. First, interface elements exist as programming code. Second, visible texts in the GUI are shown in natural language. Third, interfaces follow a model that is only perceived through their visual organization and the actions it allows to do. Interfaces can then be seized as enunciation acts, as objects that reflect design choices, as pieces of culture that will endure (or not) as the system is used.

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SEMIOTIC MEDIATION FOR THE SUSTAINABLE DIGITAL EMPOWERMENT OF OLDER ADULTS

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Abstract

As digital technologies proliferate, older adults are still facing significant challenges in achieving sustainable digital empowerment. This qualitative study examines the metaphorical registers spontaneously mobilized by seniors when discussing digital tools. It also highlights subjective semiotic framings which hinder their digital acculturation. Through ethnographic observations of digital literacy training, we identify diverse metaphorical projections conveying apprehensions (technologies as "nests of problems", "magical" realms) but also motivating drivers towards meaningful digital

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appropriation. The findings underscore the importance of symbolic mediation strategies, in order to deconstruct inhibiting traditional theories and foster technology uses rooted in the life contexts of seniors. By elucidating the complex interplay of cognitive, emotional and cultural tensions shaping digital relationships, our research project argues for designing digital training less as technical instruction than as holistic empowerment journeys integrating identity-related dimensions. Ultimately, research on these semiotic foundations contributes to broader societal efforts that ensure equal voices for diverse knowledge approaches in an increasingly AI-dominated world. Only through such inclusive mediation efforts can we truly accompany digital "immigrants" toward affirmative technological citizenship.

Keywords: digital empowerment, older adults, metaphorical registers, semiotic mediation, digital acculturation

The rapid evolution of digital technologies has brought about major societal transformations, raising significant challenges for segments of the population less familiar with these tools. Older adults, often referred to as "digital immigrants", can face particular difficulties in embracing the digital world and developing sustainable digital skills. While operational training courses exist, fewer initiatives address the deeper symbolic dimensions and mental representations which shaping the relationships of seniors to technology. This research project examines the metaphorical registers mobilized by elderly learners when discussing digital tools, highlighting the importance of semiotic mediation for enabling genuine and lasting digital empowerment.

By the "sustainable digital empowerment" of seniors, we are referring to an emancipatory acculturation process which allows this population to fully appropriate digital technologies in line with their realities, aspirations and life rhythms. Beyond simply acquiring operational skills, it involves developing a true cognitive ease, a form of "digital citizenship" which fosters social inclusion, well-being and self-expression in the hyper-connected age. This empowerment relies on mediations transcending purely technical dimensions to integrate the symbolic, affective and identity-related dimensions structuring relationships with digital technologies.

The notion of semiotic mediation refers to the interpretive frameworks, imaginaries and symbolic representations which mediate our relationship to objects and situations. These subjective meaning-making processes pro-

foundly influence learning, practices and behaviors. In the digital realm, previous research has shown that metaphors and symbolic projections play a key role in shaping uses and appropriation, particularly among vulnerable publics with limited technical mastery. However, these representational dimensions remain underexplored in digital literacy programs targeting seniors.

Digital inclusion, defined as emancipatory access and use of digital technologies for all, constitutes a major social issue highlighted by numerous works in the humanities and social sciences. The concept emerged around the turn of the 2000s, driven by a political will to face digital divides within contemporary societies. Beyond access to digital tools, the aim was to foster socially inclusive uses.

The adoption and use of ICTs by older adults is influenced by a complex set of psychosocial and motivational factors. Although material and economic obstacles are important, recent research has underscored the key role played by psychological, social and cultural dimensions in structuring digital behaviors. These often invisible psychosocial barriers constitute a major impediment to digital inclusion of seniors, calling for a deeper understanding of their principles.

Indeed, the cognitive, affective and identity processes at play are nourished by a bundle of sometimes contradictory social representations about aging and ICTs. Between deficit imaginaries and promises of emancipation, the subjective relationship of seniors to technology use has proven to be highly ambivalent. It is precisely this tension which needs to be analyzed in order to better grasp the psychosocial levers for ICT appropriation through the lens of age.

Moreover, studies show that regular internet use improves psychological well-being, reduces feelings of loneliness and prevents cognitive decline in older adults (Khosravi & Ghapanchi, 2016). Corroborating these results, a longitudinal study in the UK has revealed that persistent non-use of ICTs significantly increases risks of social isolation and dependency among seniors (Ueno et al., 2023). The British study (Ibid.) highlights the amplifying effects of various disadvantages (gender, housing, territorial divide, ethnicity) on internet non-use among the elderly, underscoring the weight of attitudes and motivations, thus confirming the vicious circle between digital and social exclusion in old age, calling for targeted interventions.

Ultimately, fostering positive and empowering representations of connected aging appears as a decisive lever to stimulate engagement among seniors. However, this shift in mentalities cannot ignore a fine-grained accounting of perceived and experienced vulnerabilities in old age, in order to better address them.

Theoretical Framework

This research work draws on several complementary theoretical perspectives. First, we focus on sociocultural approaches for learning, considering it as a process grounded in social interactions and mediated by symbolic artifacts inherited from culture (Vygotsky 1978; Wertsch 1991).

This initial anchor is articulated with the contributions of psychosocial currents highlighting the complex interweaving between cognitive, affective, and identity dimensions in shaping representations, motivations, beliefs of personal efficacy, etc. (Deci & Ryan 2000; Carugati & Perret-Clermont et al., 2004).

Secondly, we refer to conceptual metaphor theories (Lakoff & Johnson 1980) which have revealed the deeply structuring character of metaphorical projections in the organization of our mind, rather than just being rhetorical or ornamental devices.

Metaphor involves using a word with a sense removed from its original meaning. Lakoff and Johnson (1980) proposed that metaphor is not just about using words, but about making connections between concepts.

Metaphors can "select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation" (Entman 1993: 52).

Some metaphors introduced in public discourse to frame an issue may gradually become conventionalized: they become standardized and unnoticed ways of commonly referring to this issue in everyday discourse (Burgers 2016). However, a conventionalized metaphor does not necessarily remain constant over time. A shift in the conventional metaphors speakers of a language ordinarily used to frame an issue often indicates and results from a modification in their beliefs or experiences of this issue, which are socially and culturally rooted (Jensen 2015; Nascimento & Chown 2023).

However, the extent to which the internet, or indeed any mass medium, can be separated from the "real" place of our everyday experience has been questioned. Deuze (2012) goes even further to argue that, in the early twenty-first century we do not just use more media, nor do we use these media more often, but we live our everyday lives through media and our experience of reality is almost completely mediated.

What Markham foresaw is essentially an evolutionary change in the metaphors used for the internet, whereby "old metaphors are slowly replaced by new ones over relatively long stretches of time" (Burgers 2016: 256). Markham was not alone in thinking that a day would come when the

internet is ordinarily spoken of as real place, as one of the multiple ways of experiencing real life (Nunes 1995; Blavin and Cohen 2002).

Applying these complementary theoretical lenses, the present study focuses on the metaphorical registers and symbolic projections through which older adults, often labeled "digital immigrants", make sense of digital technologies. Unraveling the semiotic framings which underlie the experiences of this population appear all the more pressing against the backdrop of the rapid proliferation of artificial intelligence across daily life spheres. Indeed, while GAI (Generative Artificial Intelligence) is increasingly omnipresent, a significant proportion of older people remain distant from the most basic digital tools and environments, such as computers or smartphones.

By highlighting the metaphors, imaginaries and cultural tensions that shape older adults' attitudes towards ICT, we seek to elucidate the symbolic barriers that perpetuate digital exclusion well beyond operational skills deficits. Our premise is that sustainable digital empowerment relies on mediation strategies that deconstruct limiting popular theories and promote authentic and meaningful technological appropriation. Analyzing the metaphorical discourses of seniors can thus inform more culturally-adapted, inclusive pedagogical approaches to facilitate their digital acculturation as "immigrants" to these new experiential realms.

This symbolic reframing work contributes to broader cognitive equit endeavors. It ensures diverse knowledge systems, and life-world experiences have an equal voice in an increasingly GAI-driven society. As technological change overwhelms many people's symbolic coping mechanisms, research into the semiotic foundations of human-technology relationships becomes all the more vital.

Methodology

This qualitative study was designed to gain deeper insights into the metaphorical registers and symbolic representations mobilized by older adults when discussing and engaging with digital technologies. The research took an interpretive approach grounded in direct observations of training sessions and spontaneous discourse.

Data Collection

The study was conducted through non-participant observation of informal focus group discussions and interviews during digital literacy training courses for older adults. The fieldwork took place in the city of Metz, France between October and December 2022. Data was collected across 6 separate training sessions spanning a total of 54 hours of observation time.

The sample consisted of 39 elderly participants aged 65 to 82 years old enrolled in a digital skills program. The aim of the courses was to develop basic competencies in using computers, internet, and common digital tools/applications over a 3-week period. Thus, the observation was passive and was carried out directly at the back of the classroom, and consisted of taking handwritten notes without intervening during the sessions.

The focus was on capturing spontaneous verbal expressions, conversations, questions and narratives from learners about their experiences, challenges, emotional positions and meaning-making in relation to digital tools and environments. Particular attention was paid to metaphorical formulations, imagined analogies or symbolic projections used by participants to externalize their conceptions and interpretations of technologies.

Throughout the observation process, detailed field notes were taken, in order to transcribe key segments of discourse as accurately as possible. After each session, the notes were reviewed and expanded with additional contextual details captured in a research diary.

Data Analysis

The full corpus of compiled notes was then subjected to an iterative coding process inspired by thematic analysis principles (Braun & Clarke 2006). The first cycle utilized open coding techniques, in order to identify recurrent metaphors, symbolic referents and figurative expressions employed by participants across the dataset.

In the second cycle, these initial codes were grouped into broader thematic categories representing interpretive metaphorical registers (e.g. threat/danger metaphors, temporality metaphors, symbolism of control, etc.). Particular attention was paid to contrasting or ambivalent instances within the same register to capture nuances.

The resulting thematic structure was then reviewed against the full dataset and existing literature, in order to refine coherence and ensure robust representations grounded in the empirical material. Key excerpts were considered as illustrative verbatim examples substantiating each overarching metaphorical category.

It is important to note some limitations of this methodology. The non-intervening observer position makes its immersion relatively limited, which could hinder the deep contextualization of some metaphorical uses. The public setting of the group may also have reduced spontaneity compared to individual interviews for some participants. However, efforts were made through extended engagement over multiple sessions to improve reliability.

Results

The analysis revealed a wide diversity of metaphorical registers mobilized by participants to express their relationship to digital tools and environments:

1) Metaphors of threat/danger

Computers were repeatedly depicted using metaphors connoting threat and danger, such as being described as "nests of problems and fraud". Actions on digital devices prompted expressions of "fear of messing everything up" or causing irreversible damage. One participant notably declared: "In the end, the computer is a nest of problems, of fraud!" after a lesson on identifying fraudulent emails. This cluster of metaphors conveys strong feelings of mistrust and apprehension towards the digital world.

2) Representations of complexity/strangeness

Digital operations and codes were often portrayed through metaphors of inscrutability and mysticism, experienced as strange, complex realms. Passwords were directly qualified as "magical" by one learner struggling to type it in correctly. Another stated: "I won't be able to remember all of this, it's clear and clean" when downloading an image, pointing to perceived complexity. Expressions such as "there are many manipulations to do" or "it's all that I don't know" (referring to Facebook, Twitter, YouTube) framed the digital as an arcane, labyrinthine universe.

3) Symbolism of control/lack of control

Contrasting metaphors surfaced around the notion of control. Some participants favored metaphors associated with printed, well-formatted documents ("a clean, printed thing") with authority and impact, preferring this to handwritten notes. This echoes a desire for mastery. Conversely, others expressed losing grip through phrases like "I don't dare touch anything anymore!" or "if I move it [the laptop], I'm afraid I won't manage to reconnect to the internet". The portability of devices seemed to threaten their fragile sense of control.

4) Temporality projections

The fast pace of digital evolution was a recurring source of metaphorical depictions. Learners described the digital world as "going too fast for me" or "evolving too quickly". One vented: "Digital goes much too fast, at least for me. (...) The problem is that it evolves too fast". These metaphors convey a

sense of decoupling between digital temporalities and personal rhythms of life.

5) Cultural tensions

For some, the digital realm was constructed in metaphorical opposition to valued spheres of life. One participant highlighted: "I like nature, the forest, hiking. (...) I don't feel at ease, nor in line with this [digital] society". The digital seemed antithetical to certain traditional reference frames and lifestyles.

6) Psychological obstacles

Psychological brakes were frequently verbalized through metaphors expressing "fear" as a blocking force ("fear is what blocks me") and lacking daring ("I don't dare anymore"). Another recounted: "At first I did better than my husband because I used it at work. But now he has caught up with me. Actually, it's mostly because I'm afraid, I don't dare. So really, it's fear that blocks me a lot."

7) Motivation drivers

While obstacles abounded, instances of motivation drivers were also metaphorically captured. Engaging in situations "that will really be useful" (like buying train tickets online) were construed as powerful engagement levers by participants. As one senior put it: "I'm glad, finally something that will be useful to me (...) And then when it really serves me, well I'm motivated."

8) Posture of learning

Many narratives represented the acquisition of digital skills as a path to be followed in a pragmatic and step-by-step manner. They mobilized metaphors of "beginnings" and "driving", with supportive statements like: "It's already very good, you have to start somewhere (...) it's like driving, it will come with practice". Conditional linguistic forms (could, would) also suggested conceiving technology mastery as a gradual progression.

9) Critical perspectives

While the observation is initially marked by perplexity, some interventions have signaled the emergence of more detached and critical attitudes. Redundancies between tools were questioned ("Doesn't Facebook overlap with Google a bit?") and questions have been raised about the real added value of certain uses compared to offline alternatives.

This rich tapestry of symbolic projections and metaphorical discourses illustrates the complex interplay of cognitive, emotional, experiential and

cultural factors which underpin digital technology relationships among seniors. They reveal simultaneously inhibiting apprehensions and motivating drivers which training programs must resolve through finely tuned semiotic mediation strategies.

Discussion and Conclusion

The diversity of metaphorical registers identified in this study offers a rich window into the complex psychosocial and cultural dynamics shaping older adults' relationships with digital technologies. Several key insights emerge:

Firstly, the results highlight significant symbolic obstacles and threatening imaginaries that training programs must attentively address. The depiction of computers as "nests of problems and fraud" or digital operations as "magical" speaks to deep-seated apprehensions rooted in feelings of strangeness, lack of control, and even potential menace from these tools. Such anxieties likely stem from limited prior exposure but are powerfully reinforced by vulnerability discourses proliferating in public spaces. They risk becoming self-fulfilling by severely hampering motivation and self-efficacy. Overcoming these inhibiting metaphors will require dedicated semiotic mediation strategies centered on reassurance, demystification and appropriation through concrete, meaningful usage situations chosen by learners themselves.

Secondly, the temporality metaphors ("going too fast", "evolving too quickly") underscore generational tensions around the speed of change. The design of training must be attuned to the demands of seniors for measured, step-by-step progressions which honor their life trajectories and developmental needs. An overly accelerated pace disconnected from personal rhythms seems counter-productive. Instead, an open-ended, continuous learning model focused on ensuring sustainable mastery over a few key usages appears more advisable.

The symbolism of control metaphors such as "not daring to touch anything" or fearing laptop mobility also points to critical self-esteem issues around technology, particularly for this segment of the public with limited opportunities to develop self-assured digital identities over their lifetimes. Fostering an internal locus of control, a sense of agency through empowering experiences scaffolded by trainers emerges as paramount.

Meanwhile, the motivational metaphors equating usefulness with engagement ("when it really serves me, I'm motivated") provide encouraging indications for stimulating initial investment. Co-constructing training

pathways centered on the lives and priority needs of participants is decisive in overcoming inhibitions.

Interestingly, cultural tensions surfaced which separate digital worlds from certain life spheres like nature. This symbolic divide highlights representation nodes requiring bridging work to facilitate acculturation and combat rejection framings. Drawing parallels with valued reference activities could facilitate meaning transfers and soften perceived cultural ruptures.

Finally, the critical perspectives such as tool redundancy interrogations which occasionally surface suggest existing reflexive capacities to build upon. Nurturing such distancing and analytical skills through collective discussions and semiotic explorations could accelerate appropriation by repositioning learners as actors shaping technology usages to personally resonant ends.

Overall, these results confirm the paramount importance of integrating symbolic mediation components into digital literacy programs beyond purely operational skill transmission. Only by eliciting, deconstructing and positively resignifying the metaphors and imaginaries surrounding digital culture can we effectively accompany elders towards autonomous digital empowerment aligned with their life contexts and aspirations. The key lies in conceiving training less as technical instruction than as holistic acculturation journeys towards inhabiting these new worlds with affirmation and self-determination.

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METAPHOR OF THE DATABASE: A TASTE CONSTRUCTION[1]

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Abstract

At the present time, we are metaphorizing in the sense of Lakoff (1998) regarding the creation of a *database* which can generate new tastes using artificial intelligence. On the one hand, there is a discussion about whether artificial intelligence is capable of creating new tastes, while on the other hand, there is a metaphorization based on the translation of our experiences and sensory perception. These elements are central when analyzing the metaphorization of the *database* for the construction of new tastes. The discussion is characterized by the problematic translation of perception between humans and its transfer to the machine. In order to analyze this phenomenon, I shall rely on Lotman's (1999) notion of translation, as well as

[1] The issues addressed in this article are currently being investigated as part of my doctoral thesis at the University of Turin and the University of Lille.

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the notion of Hartley, Ibrus, and Ojamaa (2021) of how the translation from sensory perception to digitization occurs. It is important to note that, according to Hartley, Ibrus, and Ojamaa (2021), this translation to the digital sphere is primarily carried out through linguistic means. It is this element which allows me to connect it to Lakoff's (1998) notion of metaphor. The methodology developed in this article is based on the semiotics of Charles Sanders Peirce (1839–1914), since it enables me to comprehend the notion of experience. Additionally, I shall draw on concepts developed by Biggio (2020) as he focuses on the computational phenomenon, combining a linguistic and social perspective. In order to understand these phenomena, I shall present some case studies related to taste and artificial intelligence. In summary, this study aims to shed light on the metaphorical connections between artificial intelligence and the construction of new tastes.

Keywords: taste experience, metaphor, database, artificial intelligence, translation

Introduction

For a number of years, contemporary society has been undergoing a process of information digitization, which subsequently has evolved into the nucleus for creating an extensive *database*. Various instances exist where artificial intelligence is applied across diverse dynamics, influencing daily life. In the case studies central to this article, the focus is on establishing a *database* with the objective of formulating novel gastronomic tastes.

In order to conduct this analysis, I have employed a qualitative methodology, examining various applications and functions such as *Sous Chef* by *ChatGPT*, *Bing*, and *Flavor Graph*. These serve as direct examples of the use of artificial intelligence in influencing the realm of gastronomy.

Within this analysis, I draw upon Charles Sanders Peirce's (1839-1914) semiotic theory as a foundation, since it allows me to comprehend the experience and *habitus* created within the development and acceptance of new gastronomic tastes. Additionally, referencing digital case studies, I find it relevant to consider Biggio's (2020) study which establishes the interactive relationships between humans and machines. As Biggio (2020) asserts, "we will not be concerned with computer-mediated social interactions, but rather with solipsistic experiences of the user facing the computer, in which it seems permissible to trace forms of computational enunciation occurring between an artificial instance and an empirical human subject" (Biggio 2020: 384).

Hence, we recognized that in the case studies showcased herein, the significance of comprehending these aspects within the framework of the notion of experience, particularly in light of the concept of taste, is paramount. In this analytical context, it is essential to transition from the definition of taste – a dimension we subsequently explored – as a sensory perception to an understanding of what constitutes a taste experience. This transition is crucial for capturing its semiotic meaning and significance.

If we commence with the premise that each piece of information in the *database*, involving recipes and chemical compositions of different ingredients in these instances, is designed in such a way that artificial intelligence can generate possible new taste combinations, they inherently involve the element of an experience translated into the digital sphere. Using this focal point, along with Lakoff's (1998) concept of metaphor, we can comprehend that the *database* implies a metaphor. "But metaphor is not merely a linguistic matter; it is a matter of conceptual structure. And conceptual structure is not purely an intellectual issue; it encompasses all the natural dimensions of our experience, including aspects of our sensory experience: color, shape, texture, sound, etc." (Lakoff 1998: 288).

In this conceptual framework, we understand that the construction of the *database* involves a metaphorization of the same. However, there are different levels of translation in the sense of Lotman (1999). At a primary level, we encounter the experience of human perception concerning the taste experience. On the other hand, a translation is conducted to digitize these mechanisms, thereby forming the *database* that will be utilized for the creation of new taste combinations.

In Lakoff's terms (1998), metaphors facilitate the comprehension of experience, and new metaphors have the ability to generate novel understandings and realities (1998: 288). Consequently, we understood that we are currently witnessing a new reality and, therefore, a new metaphor entailing the creation of this *database*.

In order to gain a deeper understanding of the aforementioned phenomena, we consider it relevant to delineate certain definitions of taste to navigate the transition from taste as a sensory perception to the realm of taste experience. This involves comprehending sensory encounters through Merleau-Ponty's theory of perception (2014) and enriching this perspective with Peirce's notion of experience (CP 1.335)[2].

[2] The citations to the work of C. S. Peirce are made in the usual manner: CP [x.xxx] refers to the volume and paragraph in *The Collected Papers of Charles S. Peirce* edition.

Taste & Experience

Over the years, a multitude of scholars from diverse perspectives in the field of human sciences have been engaged in ongoing research on the phenomenon of taste. Noteworthy researchers in this area include Appadurai (1988), Appiano (2012), Barthes (1986), Bianciardi (2011), Bourdieu (1979, 2010), Boutaud (2011, 2019), Fischler (2001), Mangiapane (2021), Marrone (2013, 2014, 2015, 2016, 2022), Mazzocut-Mis (2015), Perullo (2011, 2016), Pfirsch (1997), Stano (2005, 2012, 2015, 2017, 2018, 2019, 2020, 2021), and Volli (2015), among others.

A central element emerges from all these research efforts: in order to analyze the taste experience and flavor, it is essential, on the one hand, to define taste as an element that combines both its individual and social aspects, while on the other hand, to understand its synesthetic characteristics. Every time we engage in a tasting process, a dynamic unfolds where the meaning of this act involves not only the sense of taste, but also entails a combination of elements that go beyond taste and appeal to all human senses – touch, sight, hearing, and smell. Henceforth, my focus lies on examining taste as a sensory perception and the intricate process of interpreting the meaning and signification it entails. In the concrete act of tasting, a set of sensations occurs simultaneously which allow for and constitute a taste experience. For this reason, I shall focus on the idea that all the senses come into consideration. Aat the same time, in order to create the *database*, that metaphorical sensory translation needs to be done before creating a new taste. It is worth noting that the distinction of the importance of all senses is purely theoretical-methodological, since everything occurs simultaneously in the process.

First of all, it is relevant to focus on the concept of taste which finds a correspondence in the studies cited earlier. Within the definitions of this concept, I will focus on Lorenzo Bianciardi's (2011) explanation, since it allows for the development of the dynamic relationship between the individual and the social. The author begins by defining taste as an element which emerges after each tasting and involves the ability to recognize the specific flavors of each food. This mechanism includes the voluntary selection of certain flavors over others (Bianciardi 2011: 31). According to Bianciardi (2011), in the case of taste, we are always confronted with a differentiation of the value of each tasted ingredient. This understanding is associated with subjective personal matters, as well as with the context where the subject is located. This can affect the type of taste derived from ingredients that are accepted as edible in a given culture.

Within this dynamic, Bianciardi (2011) argues for the importance of viewing taste as a matter of primary concern to the individual and their relationship with the object, which in this case is the dish to be tasted. Simultaneously, there is a need to reflect on and emphasize the different aspects which need to be considered when analyzing taste. According to Bianciardi (2011: 29–75), one of the central problems of taste is to define its duration. This takes into consideration both the physical-biological aspect (tongue, palate, nose) and its cultural aspect.

Revisiting the concept of taste as a biologically-rooted phenomenon impacted by cultural factors, we are confronted with a dual form of discrimination. One aspect pertains to the individual, while the other is intrinsically linked to the societal norms within which the individual is situated. Within this framework, it can be traced a cultural semiotic structure, inspired by Lotman's (1979) portrayal of culture. He portrays culture as a universally organized system which must juxtapose itself with non-culture in order to establish its identity. This is essential to consider when contemplating the creation of the *database* in such a way that artificial intelligence can subsequently provide new ingredient combinations leading to a novel taste experience.

Another fundamental aspect to consider in the creation of the *database* is the existence of a social classification of the value of taste linked to a taste memory, as pointed out by Jean-Jacques Boutaud (2011: 7). Boutaud contends that individuals retain memories associated with their dining rituals and the context in which a dish is savored. According to Boutaud, during communal eating rituals, individuals engage in a personal "bricolage" between their subjective memories and the actual experience of consuming food (ibid.: 30). "Each food, like each dish, has a story: its own story, found in the collective imagination; but it also has a personal story, found in us, in our memory. Therefore, in the experience of food, the food always remains something to discover and taste again" (Boutaud 2011: 39).

Boutaud (ibid.) posits that a cognitive process linked to taste intricately blends sensations, flavors, and memory. Thus, memory plays a crucial role in shaping the sensory perception which fundamentally evolves into a taste encounter. However, to grasp this evolution of memory, one must transcend the concept of taste as a mere sensory function and explore the necessity of transitioning to a taste experience in order to analyze it fully, thereby unraveling its sense and meaning.

Therefore, one of the main problems we encounter involving taste is the sensory complexity. Hence, an analytical classification needs to be established which takes into account all the senses.

Taking up Boutaud's (2011) terms and focusing on the visual aspect of taste allows to recognize a problem of the image and taste also emphasized by Stano (2017: 421). Stano reflects on the concept of the "taste image" created by Boutaud (2011) which arises from the interrelation between different levels presented in the image of a dish to be tasted. Initially, there are the sensations generated by that taste image. In other words, this is an aspect which initially relates to the subjective inner sensations evoked by the image of each food. On the other hand, there is a discursive dimension. This is a process through which one moves from sensations to words: the description of the dish to be tasted, which implies a translation between the sensory dimension and language. In accordance with the aforementioned source, there is a transition from what would involve a "sensory image" to what would be the "taste image". According to the same source:

> The term "sensory image" is used in the physiology of perception but corresponds to operations of qualitative and quantitative coding; a third component is added to them, the hedonic component. The first two components, which play a role in taste discrimination, depend solely on the physico-chemical properties of what is ingested. Qualitative coding allows for identifying the nature of the stimulus, for example, sweet or salty, based on previous experiences (ibid.: 64).

The concept developed by Boutaud (2011) regarding the levels of the "taste image" in this article is closely related to Peirce's semiotics. The three levels outlined earlier can be aligned with the levels proposed by Peirce who analyzes reality and experience. Peirce employs the semiotic *Phaneron* to elucidate the experience of individuals, consisting of three fundamental elements: the universe of sensations (*Firstness*), corresponding to Stano's (2017) and Boutaud's (2011) first level; the discursive dimension (*Secondness*), which encompasses the transition between sensations and the tangible object to be tasted; and lastly, the scenic level (*Thirdness*), which pertains to the symbolic and implies the symbolic character of *Thirdness* as defined by Peirce.

In this paper, I specifically focus on Peirce's framework to explicate the taste experience, while drawing on the concepts of "taste image" and "taste memory" developed by Boutaud (2011). In order to illustrate the taste process, I provide an example of a tasting experience using the terms previously mentioned. Peirce's perspective on experience (CP 1.335) proves valuable in understanding the unfolding of a taste experience. By employing this theory, I shall analyze how the process of tasting unfolds. The individual progresses from *Firstness* (CP 1.302), which, as previously described, em-

phasizes the sensations produced by taste prior to the actual act of tasting. The concrete sensations manifest distinctly during the moment of tasting. This indicates a multitude of possibilities before the specific moment of consumption, when the subject cannot yet actualize these sensations.

According to Peirce, *Firstness* implies that "freedom can only manifest itself in unlimited and uncontrolled variety and multiplicity. Thus, the first becomes predominant in the ideas of unlimited and varied senses. It is the guiding idea of the "variety of senses" (CP 1.302). It is worth noting that the amount of possibilities established by *Firstness* depends on the society to which the subject belongs, since the possibilities of certain ingredients to be tasted or not depend on the culture in which subjects find themselves. This concept echoes Lotman's notion of culture (1979), who claims that each culture, to define itself, needs a non-culture. In this particular case, this notion involves the definition of which elements are considered edible and which are not, in order to create a distinctive culinary identity. This is central when having the information to create the *database*.

Given this framework, in order to discuss the next step of the taste experience, this article will explore what Peirce refers to as *Secondness* (CP 1.325) which is strongly linked to the inherent characteristics of the object to be tasted. An example of this concept could be given by defining the temperature and texture of the element being tasted. According to Peirce, in Secondness, "secondness is predominant; for the real is that which insists upon forcing its way to recognition as something dyad consists of two subjects brought into oneness. These subjects other than the mind's creation" (CP 1.325).

Finally, I shall highlight the concept of the semiotic *Thirdness* (CP 1.26), in the sense that if the individual belongs to the culture from which the tasted comes from, they will be able to define, categorize and classify tastes and flavors. Following this process, it is possible to describe a taste experience when the individual manages to recognize the tasted elements. Notably, at this point in the process, we engage with *Thirdness* (CP 1.26), namely, the *Interpretant*, which enables a *semiosis* of taste recognition and of taste experience. It is essential to clarify that this tasting process occurs instantaneously and concurrently. This is crucial to understand the translation of this process so that artificial intelligence can generate new tastes and, at the same time, provoke a new type of taste experience.

At the same time, one of the elements to take into consideration is precisely the visual sense. This is one of the senses which most impacts the taste experience and is closely linked to the creation of images of new and traditional recipes produced by artificial intelligence. We will examine

these cases in the case study section of this article, where the translation of the visual sense created by artificial intelligence can be observed. In this case, I will focus on traditional dishes and how artificial intelligence represents them.

Body Perception & Translation

Another crucial element which warrants attention concerning the body and the perception of taste experiences stems from Stano's (2019: 149) perspective. This allows for a connection to be made with Peirce's (1839–1914) semiotic model of experience, reportedly discussed throughout this article. Stano (2019) argues that "the body is not only a signifier but actively participates in processes of signification (of the world in which it finds itself, of other bodies, and of itself). This opens up a wide range of issues of strong interest and semiotic relevance, from the problem of the connection between sensoriality and cognition to various practices of body writing" (Stano 2019: 149).

This element emphasized by Stano (2019) is crucial since it highlights the differences with the research conducted by Merleau-Ponty (2014) on the body and perception. In Merleau-Ponty's research on the phenomenology of perception, a characteristic Cartesian dichotomy arises between the body and the external world. From this perspective, the focus is on elements pertinent to the discussion of taste experiences and their relationship with the body and perception. As such, I incorporate Stano's (2019) emphasis on the necessity of studying the body:

> Not as a simple place but as the very instance of translation between these regimes – an instance that, precisely due to the translational work it carries out, emerges as the threshold par excellence of semiosis, as it is capable of generating, interpreting, and simultaneously circulating meaning. It is to this necessity that, in recent years, I have tried to respond in the first person, particularly by reflecting on the functioning of taste and the transition of food from the senses to meaning (Stano 2019: 158).

In order to advance this concept further, it is crucial to establish connections and enhance Merleau-Ponty's (2014) viewpoint on perception by expanding on Peirce's framework, as discussed throughout this dissertation. When elucidating Merleau-Ponty's (2014) phenomenology of perception, it is important to explore the notion of sensation, a cornerstone for grasping perception.

Merleau-Ponty (2014) posits that sensation forms an all-encompassing experiential realm, yet individuals tend to give precedence to particular

sensations which converge within specific domains. Moreover, he argues that perception itself carries an inherent significance, aligning with the challenging aspect highlighted by Stano (2019) in asserting that experiences surpass mere observed perception. Drawing from Peirce's semiotics, it can be asserted that experience is not merely an isolated event, but that rather, through experience, we develop *habitus* and gain deeper insights into our reality. Merleau-Ponty's perspective (2014) underscores that experience encapsulates a phenomenon interwoven with concrete elements, while Peirce's semiotics suggests that each experience is inevitably linked to a specific tangible object. Thus, a common thread emerges between the two theories. However, within Merleau-Ponty's theory of perception (2014), the primary challenge lies in the dichotomy between the body and the mind, rekindling a dualism which hampers the exploration of the connection between perceived objects and human beings.

One of the fundamental aspects in Merleau-Ponty's (2014) work, which also aligns with the construction of a taste experience, is the notion of the ensemble of sensations in the world that exist external to human bodies. According to the author, individuals attribute meaning to sensations because they are already immanent to the factual elements. However, adopting Peirce's theory of experience, I contend that the sense-making relationship between what is encountered in the realm of sensations and the objects eliciting those sensations is fundamentally established through *semiosis*, primarily facilitated by humans. It is here that the sense of experience, always linked to a specific object, can be found.

From this perspective, it is crucial to comprehend the taste experience through the relationship with the objects we taste and the sensations they elicit in our bodies that a specific experience is engendered. This recognition of the existence of these elements is essential for our understanding. It is in this context that the connection between the field of sensations and the objects that produce them is established primarily through *semiosis*, as facilitated by humans. The recognition of these elements allows for the acknowledgment of their existence, specifically in relation to a particular dish or ingredient. The absence of ingredient classification or specific dishes renders the determination of taste *semiosis* impossible. Moreover, the functionality of artificial intelligence heavily relies on the development of *databases*. These necessitate a classification system for the recognition of specific ingredient combinations, thereby enabling the creation of new tastes.

Regarding the issues of memory, as I have mentioned as an important element within what implies a taste experience, Merleau-Ponty (2014) asserts that:

> The fact is that, to come to completion in perception, memories must be made possible by the physiognomy of the data. Before any contribution of memory, what is seen must presently organize itself in a way that offers me a framework in which I can recognize my previous experiences. Thus, the appeal to memories presupposes what it is thought to explain: the structuring of data, the imposition of meaning on sensory chaos (Merleau-Ponty 2014: 30).

Therefore, it is evident from this assertion that memory, also referred to as recollection by the author, unequivocally exerts an influence on both our physical state and the perception of every sensation. In the realm of taste encounters, as well as all other types of similar experiences, memories play a role in shaping the significance and interpretation we assign to each sensory *input*. Nevertheless, Merleau-Ponty (2014) introduces the idea that meaning is inherent in perception and somewhat autonomous from actual lived experience, "if, finally, it is admitted that memories do not project spontaneously onto sensations and that consciousness compares them with present data, retaining only those that accord with it, then an original text is recognized that carries its meaning within itself and opposes it to that of memories: this text is perception itself" (Merleau-Ponty 2014: 31).

Consequently, it can be discerned from this statement that memory (or recollections), does not automatically superimpose sensations. Rather, consciousness juxtaposes them with present data and selectively retains only those that correspond with its current state. This dynamic gives rise to an original text which inherently embodies its meaning while contrasting with memories, and this text is none other than perception itself. The challenge of creating a taste experience presents a direct issue. Through the lens of semiotics, it becomes apparent that the meaning of an object is not predetermined by the object itself. The object, in its essence, only triggers sensory sensations such as cold, heat, texture, sound, color, and so on. However, the meaning of the object arises within the framework of taste *semiosis*, taking into account the individual's context and taste memory.

Peirce understands *semiosis* as:

> Yet this does not quite tell us just what the nature is of the essential effect upon the interpreter, brought about by the semiosis of the sign, which constitutes the logical interpretant. (I important to understand what I mean by ***semiosis.*** All dynamical action, or action of brute force, physical or psychical, either takes place between two subjects [whether they react equally

> upon each other, or one is agent and the other patient, entirely or partially] or at any rate is a resultant of such actions between pairs. But by "semiosis" I mean, on the contrary, an action, or influence, which is, or involves, a cooperation of ***three*** subjects, such as a sign, its object, and its interpretant, this tri-relative influence not being in any way resolvable into actions between pairs. {Sémeiösis} in Greek of the Roman period, as early as Cicero's time, if I remember rightly, meant the action of almost any kind of sign; and my definition confers on anything that so acts the title of a "sign".) (CP 5.484, emphasis in the original).

Therefore, it is through this relationship that we can comprehend the meaning and significance of the taste experience, albeit partially contradicting Merleau-Ponty's explanation. It is necessary to incorporate aspects of both theories within the experience to achieve a comprehensive understanding of the phenomenon's complexity, particularly by integrating Peirce's semiotic theory.

Therefore, the transition and translation of all these elements needs to be done which would imply their digitization to create the *database*. This would explain the cases of the electronic nose (Alphus 2009) and electronic tongue (Urueña 2004). I maintain that these elements can be seen as a metaphorization of human perception transitioning to digitization. I support this assertion based on how Lakoff (1998) defines metaphor. According to the author, "the metaphors that structure our perception, our thinking, and our actions. To give an idea of what it means to say that a concept is metaphorical and that it structures our daily activity" (ibid.: 22). In summary, understanding that to analyze taste, perception needs to be considered, and a new taste created mediated by artificial intelligence, a digital translation of information is required.

As Hartley, Ibrus, and Ojamma (2021) argue, "the fundamental process underlying digitization is translation from continuous (analogue) codifying systems to a discrete (digital) system, which is in principle similar to translating a visual text into a text in verbal language" (Hartley, Ibrus, and Ojamaa 2021: 87). Additionally, the authors maintain that there is a process of translation within the language used to create the *database*. They state that the "database is not only a signpost pointing towards the text or a simple means via which we automatically get to the text but also a model of the text itself, the extra-textual reality that the text mediates, as well as the text's potential and real uses and positions in dynamically changing contemporary cultural networks" (Hartley, Ibrus, and Ojamma 2021: 135). Within the conceptual framework of metaphor as employed by Lakoff (1998), we understand that there is a metaphorization which allows us to comprehend our perception, transitioning to the creation of the *database*. It is for this

reason that there is a metaphorization of the database to create a new taste with artificial intelligence.

Cases of Study

I shall present specific cases regarding the utilization of artificial intelligence to generate new tastes. In collaboration with Sony, Korea University developed an application named *Flavor Graph*. This application, leveraging a comprehensive *database*, adeptly combines ingredients which have not been utilized previously. The functionality of the application relies on a detector for the chemical components of each ingredient, recognized through *machine learning*. Consequently, it produces a guide outlining the ingredients that have been previously combined and suggests potential combinations not previously explored by humans, as illustrated in Figure 1.

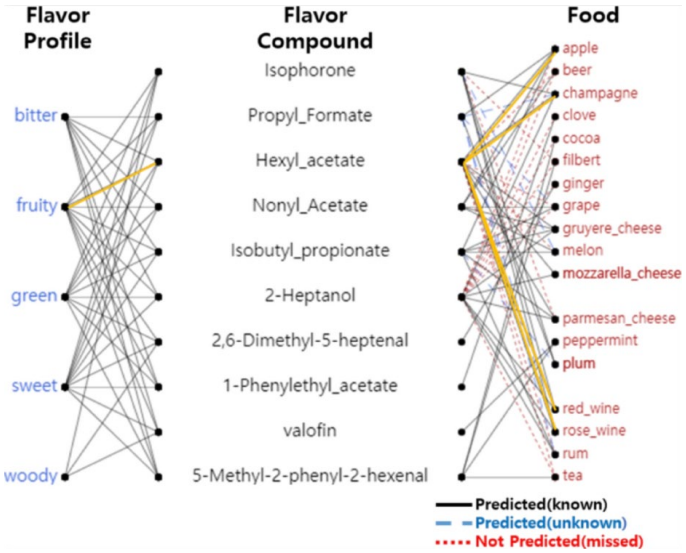

Fig. 1: *Flavor graph*

This case is an exemplar which underscores the significance of metaphorizing the *database*, given that the entire outcome depends exclusively on information from translated sensory perception to generate the algorithm's response.

Another case I present involves the aforementioned scenario where information is solicited from artificial intelligence systems such as *Bing* and the *Sous Chef* function of *Chat GPT* to generate images of typical dishes from locations considered significant in European gastronomy, such as Italy, France, and Spain. It is important to note that the outcomes of these images depend on the user's geographical location, the inputted words,

and, importantly, the metaphorization of the *database* embedded in these applications. It is crucial to consider that, as mentioned earlier, images play a significant role when contemplating a taste experience, since they directly impact the visual sense as implicated in each taste experience. Subsequently, I present images generated with the *input*: typical Italian, French, and Spanish food.

Fig. 2: *Sous Chef* Italy

Fig. 3: *Bing* Italy

Fig. 4: *Sous Chef* France

Fig. 5: *Bing* France

Fig. 6: *Sous Chef,* Spain

Fig. 7: *Bing*, Spain

From the perspective of visual semiotic analysis, we can assert that these images, considering Greimas and Courtés's (1986) semiotics with their definition of *débrayage*, become central concepts in understanding the sense and meaning of these images. The creation of these images depends on the external framework of what is in the image. They rely on the metaphorical construction of the *database*, the geographical location where the user performed the search, and the words used as *input* to generate such images. Additionally, using Peirce's semiotics, we can comprehend the importance of the context in which the images are produced, deriving the sense from that context. I argue that there is a new form of *foodporn* (Allard & David 2022), since these images have an artificial aspect which does not evoke the viewer's desire to eat the dish. Instead, they are more descriptive images because, once again, the functioning of artificial intelligence is based on the information in the *database*. All the recipes we find begin with the description of each ingredient composing the dish. Therefore, we can observe these images which highlight each ingredient individually rather than the dish as a whole.

Conclusion

In conclusion, we are currently witnessing a new paradigm in the creation of taste experiences facilitated by artificial intelligence. Given all the characteristics of taste mentioned in this article, it is paramount to consider the method by which information is translated into the digital sphere to construct the *database*. This becomes the focal point, enabling artificial intelligence to discern novel taste experiences.

The concept of metaphor proves instrumental in understanding the importance attached to the perception of sensations, as well as the translation involved in creating new tastes through these mechanisms. Lakoff (1998) contends that metaphors play a crucial role in comprehending our perception and every experience. Both these elements are pivotal when contemplating the development of new tastes mediated by artificial intelligence.

Therefore, the way in which we structure our thinking, perception, and experience is impacted and translated into the digital realm, subsequently enabling the creation of new tastes. However, it is important to reflect on the ethical implications concerning the authenticity of such gastronomic elements. Attributing the creation of a taste to artificial intelligence may simply be due to a lack of information. In other words, a deficiency in metaphorical translation within the *database*. In conclusion, I contend that semiotics can assist in elucidating these issues and prompt a reexamination

of the current production paradigm surrounding the creation and construction of a novel taste experience.

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METAPHORS OF SUBVERSION IN SURVEILLANCE ART PHOTOGRAPHY

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Abstract

The study addresses the way in which visual and discourse metaphors embody subversion in contemporary forms of documentary photography which investigate and illustrate the issue of surveillance. Surveillance art is part of a new configuration of the vigilance phenomena entailed by massive digitalization, in which the classic roles of the observer and the observed have been replaced by complex participatory dynamics.

Combining social and cognitive semiotic approaches from a theoretical point of view, the analysis dwells on a corpus formed of imagery by Hasan Elahi, Tomas van Houtryve, Mishka Henner. The purpose is to detect and discuss a typology of visual metaphors, as well as metaphorizations of situations in curatorial and other discursive practices which accompany the photographic projects.

Grammar of Visual Design by Kress and van Leeuwen will serve as the main theoretical starting point in defining and explaining a series of in-

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ternal structures and visual mechanisms which produce a diverse array of subversive effects. The study further aims to discuss metaphors related to discourse practices, since all the art projects belonging to the aesthetics of surveillance are accompanied by an ample series of textual instances. There is also the hybrid manifestation, in which we can speak of interplay between images and texts. The aim is to create counter narrative effects, a phenomenon which can be considered a form of artistic hacktivism.

Finally, we will argue that the resemantization of images and the perceptive implications related to this process are part of a deep social and psychological phenomenon. They represent a powerful indicator of the radical changes in the way in which we define the private and public sphere through the digital lens.

Keywords: surveillance art, subversion, visual metaphors, discourse metaphors, resemantization

1. The Pulverization of Surveillance and its Artistic Metamorphoses

1. 1. The Recent Evolution of the Veillance Phenomena and Terminology

During our recent digital culture development, the concept of *visibility* and the notion of *surveillance* have evolved into a vast array of phenomena, highly amplified and diversified by the rapid proliferation of online tools and platforms. Digitalization brings to the fore new forms of surveillance, leading to a process of decentralization and to the dissolution of the dyad *observer/observed*.

In their analysis of these phenomena, Steve Mann, Jason Nolan and Barry Wellman make reference to the "banalization or popularization of global surveillance."[1] Furthermore, they identify several veillance manifestations which they describe according to an orientational terminology. *Sousveillance* is defined as the action of *surveilling the surveillers*, that is the possibility of every individual to access panoptic technologies allowing them to revert the relation with authority.

[1] The three researchers are the first ones to have conceived an orientational terminology adapted to the contemporary phenomena of surveillance, that they illustrated through experiments corresponding to each facet of veillance that they identify.

It is a process of mirroring and confronting surveillance in bureaucratic organizations, a phenomenon referred to by Steve Mann as *reflectionism*:

> Sousveillance disrupts the power relationship of surveillance when it restores a traditional balance that the institutionalization of Bentham's Panopticon itself disrupted. It is a conceptual model of reflective awareness that seeks to problematize social interactions and factors of contemporary life. It is a model, with its root in previous emancipator movements, with the goal of social engagement and dialogue. (Mann, Nolan and Wellman 2003)

Subveillance is defined as *the recording of the recorders*, by using wearable video recording devices in public spaces, also called *inverse panopticon sousveillance*[2]. Collaborations among citizens are referred to as *coveillance,* a phenomenon that radically transforms the nature of veillance, by shaping it into a collective strategy and banalizing an activity whose characteristic has constantly been secrecy and hierarchical observation.

The multiplication of surveillance tools, as well as their increasingly accessible character, creates a new and rapidly changing configuration of the cultural connotations of the private and public sphere and has as a main effect the dismantling of the institution of surveillance, as well as the dissolution of the idea of a high authority watching. The digital space creates an open configuration of the sphere considered to be private and closed before the Internet era, as well as a gradual transformation through amplification of the idea of self-exposure.

1. 2. Surveillance Art and Subversion

In contemporary art, the pulverization of the veillance phenomena has led to the emergence of an aesthetics of surveillance, in which the visual and linguistic metaphors of subversion play a central part. In his article, *Anxious Architectures. The Aesthetics of Surveillance*, Eric Howeler even advocates the fact that surveillance has become an artistic phenomenon, coagulating into an aesthetics, from fashion and advertising to architecture and design. The aesthetics of surveillance thus becomes a new cultural condition, "saturated with data, fraught with uncertainties, visually and spatially anxious."

Artistic projects self-entitled *surveillance art* or displaying the characteristics of this type of art presuppose, in most cases, subversive mechanisms, a critique of the surveillance performed by authorities and, more

[2] Most of the analyses of this type of phenomena have as a starting point the Foucauldian process of *panopticism*, through which power is internalized so that it creates patterns of behavior.

often than not, a form of activism. Zhixuan Wang uses the term in order to "categorize artworks that provide critical responses to the growing surveillance activities conducted by various authorities in different forms" (2021: 3). His study is centered on the effects and limits of surveillance art and its impact as a politically critical art.

From political resistance to the critique of certain policies and defense of human rights, surveillance art projects have a powerful dimension of subversion and the purpose of creating a symmetrical power relationship. Moreover, they generate a participatory form of reception, by building awareness and active engagement of the audience. "By reconfiguring and remediating such systems, these works aim to defamiliarize the normalized surveillance culture and awaken us to the problematic and disturbing nature of omnipresent surveillance and potentially bleak future for its use" (Foster 2015: 63).

1. 3. Methodology

Surveillance Art and the Metaphors of Subversion

Our corpus analyses will be structured into three parts which identify different types of visual and linguistic metaphors in surveillance art projects: Tomas van Houtryve's drone art project *Blue Sky Days;* Hasan Elahi's self-surveillance project, *Tracking Transience*, with its printed counterpart, *Thousand Little Brothers;* and Mishka Henner's *Putin's Prison*, a case of counter-narrative text insertion on images. The theoretical framework mainly dwells on the study of visual metaphors by Kress and van Leeuwen. It also repurposes the notion of *intersemiotic translation* in approaching the relationship between text and image.

In *Reading Images. The Grammar of Visual Design*, Gunther Kress and Theo van Leeuwen adopt the framework of social semiotics, in order to elaborate a complex analysis of visual metaphors. Focusing on composition, their study identifies two types of representation structures pertinent to the survey of visual metaphors: "structures which represent aspects of reality in terms of unfolding actions and events, processes of change, transitory spatial arrangements and so on" (2001: 55), called *narrative structures*, and "structures which relate participants in terms of classification, part-whole structure or symbolic attribution" (2001: 55), referred to as *conceptual structures*. We will further discuss these two types of structures related to visual metaphors and their subversive effect in the first and second part of corpus analyses.

Composition relates the representational and interactive meanings of the image to each other through three interrelated systems: *information*

value, *framing* and *salience* (ibid.: 181–182). *Information value* refers to the placement of elements which confers upon them particular informational value attached to different zones of the image. *Framing*, the second compositional principle, refers to the use of framing devices that isolate elements from the image. An important notion related to framing is rhythm which becomes a matter of continuity or discontinuity. This makes compositional elements strongly or weakly framed from a visual point of view. Diverse ways of framing have different meaning potentials. Finally, *visual salience* results from the interaction among several elements, such as size, sharpness of focus, tonal contrast, color contrasts, placement in the visual field, perspective.

Analysis of these compositional elements identifies the ways in which visual images are built in order to create metaphors. This is a perspective which can be correlated with the cognitive semiotics approach, placing the interpretation of visual metaphors in cultural and situational contexts.[3]

Moreover, surveillance art is dependent on curatorial or explanatory discourse practices, as well as on transfers of meanings among diverse semiotic systems. The subversive effect is achieved by means of visual metaphors in a close interdependence with the rhetoric which accompanies the artistic projects and without which the activist dimension would not be possible. The multimodal character of these metaphors can be approached through the discussion of *layering,* understood as a narrative mechanism at the core of the image construction.

2. Combining Metaphor with Documentary in Tomas van Houtryve's *Blue Sky Days*

Drone strike reports are the source of a series of artistic projects for documentary photographers such as Tomas van Houtryve and Trevor Paglen, as well as for hybrid art forms which combine photography with painting, such as Mahwish Chishty's projects. This particular type of drone art has the purpose of raising questions and awareness about drone strikes with innocent victims all over the world.

From a conceptual point of view, Tomas van Houtryve's project, *Blue Sky Days*, combines metaphor with documentary in order to elaborate a sharp critique of situations in which innocent people became victims of

[3] A perspective developed by Dezheng Feng and Kay O'Halloran in *The Visual Representation of Metaphor. A Social Semiotc Approach*: "the social semiotic framework is able to provide a comprehensive account of the visual realization of metaphor, and in addition, the study also offers a cognitive explanation of how resources like camera positioning and composition acquire meanings."

drone strikes. Taking as a starting point drone strike reports from over seven countries documented by human rights groups, Tomas van Houtryve has, as a first stage, made a list of situations in which US drones have killed innocent people. The *Blue Sky Days* project has as a basic narrative layer the death of a 67-year-old woman in Northeast Pakistan. She was killed during a drone strike while picking okra outside her house: "I no longer love blue skies. In fact, now I prefer grey skies. The drones do not fly when the skies are grey"[4], declared the woman's 13-year-old grandson, Zubair Rehman, at a briefing held in 2013 in Washington DC.

Tomas van Houtryve uses visual metaphors for . the purpose of echoing this type of situation. Realized with a camera attached to a small drone, his project encompasses captures from across America. They cover the same sorts of gatherings which have become usual targets for foreign strikes, that is weddings, funerals, groups of people praying or exercising, as well as settings in which drones are used to less lethal effect, such as prisons, oil fields, and the Us-Mexico border. The artist's statement makes explicit the surveillance and subversive dimension of the project: *The images captured from the drone perspective engage with the changing nature of surveillance, personal privacy and war*[5].

The effect of subversion is achieved through two components of the visual metaphors: on the one hand, the mirroring - central to the narrative structure subjacent to the metaphor; while on the other hand, the transformative dynamics achieved through a poeticization of the referent. It contains in its turn other multiple layers: *Even when I'm looking at a sinister subject based on very difficult research talking about people being killed, and I am looking at it in a new way, there's inside me an urge to make beautiful compositions to find poetry to find moments that I want to respond to in the same way that a painter has his canvass and his palette*[6].

Redefining perspective leads to a resemantization of spaces and situations, a transformative phenomenon entirely dependent on the transmutation[7] of images into explanatory discourse. Among the components of

[4] The artist's statements and the narrative accompanying the images can be consulted at: https://tomasvh.com/works/blue-sky-days/.

[5] Ibid.

[6] News and Art Meet Through the Eyes of a Drone. https://pulitzercenter.org/stories/news-and-art-meet-through-eyes-drone.

[7] In his famous text, *On Linguistic Aspects of Translation*, Roman Jakobson distinguishes three categories of translation: 1. *Intralingual translation* or *rewording* – an interpretation of verbal signs by means of other signs of the same language. 2. *Interlingual translation* or *translation*

composition discussed by Kress and van Leeuwen, *salience* is achieved in this situation by means of an interplay between shadows and lines. This presupposes waiting for the moments during the day when people's shadows are exactly the same length as them. The central idea is that, owing to this equal length, everything you do is written on the ground. This metaphor of the inscription perduring even in an ephemeral environment creates a narrative layer of a poetic memory that makes the message extremely powerful. This *never forget* implicit content entails a reflection on the responsibility and the long-term effects of our gestures.

The metaphorical layer of the inscription also has an important intertextual dimension. This refers to the function of art to transform and to preserve historical scenes which are to be kept in memory in order not to be repeated. This compositional aspect transcends the historical fact, sending to other similar compositional schemes used in art history. Tomas van Houtryve compares the technique he uses to painting. Such a comparison emphasizes, once again, the importance of light and perspective and the placing in a lineage of influence in which the symbolic value of light plays an important part in the interpretation of the image.

The interplay between shadows and lines also becomes a way to materialize time and to give a concrete grasp of a moment that could be just before death: a construction that becomes possible through the geometry created by light. Reference to current situations of drone strikes is clear through the artist's discourse. However, the geometry of shadows depersonalizes human beings, rendering the message of activism and defense of human rights a general and atemporal one, encompassing layers of time and with a reference potential to several tenses.

3. The Metaphorization of the Private Space and the Semantic Horizon: Hassan Elahi's *Tracking Transience*

This part brings to the fore a case of subversion built through self-surveillance and through the metaphorization of the private space in which technologies are mediators of experience. In 2002, Professor Hassan Elahi from the University of Maryland was wrongly identified as a potential terrorist by the FBI, a fact that led to a six-month investigation. In this context, he began *Tracking Transience*, a long-term project, documenting his daily activities, with the declared purpose of rendering FBI's monitor activity

proper - an interpretation of verbal signs by means of some other language. 3. *Intersemiotic translation* or *transmutation* – an interpretation of verbal signs by means of signs of nonverbal sign systems.

easier. This transfiguration of a habitual vertical coercive act of surveillance into a voluntary one is actually a declared satire of the erosion of civil rights in the United States. The printed version became the object of an exhibition: *Thousand Little Brothers* contains almost 32 000 photographs from the *Tracking Transience* project, printed on seven canvas banners. Together they measure almost twenty-eight feet tall and fifteen feet wide.

Elahi's project, which started as an alibi surveillance, actually dwells on a conceptual metaphor of the private space and is based on a saturation effect. The accumulation of images constituting sequences of his daily life results in a visual narrative structure with the nature of a list. The multiplication of images representing empty beds, toilets, rooms, shelves with products from different shops, dishes results in a flooding technique:

> By opening up every aspect of my life and every little detail, I actually maintain a very private and anonymous life. All of us make data. Our phones are tracking every piece of information about us. So when you don't have enough information out in public, that's actually sometimes more of a red flag than having too much information[8].

The endless enumeration of banal details entails a no boundary impression by the incessant and overabundant exposure of private frames. This is what Umberto Eco calls *a visual list* (2009: 37–47). The intensive and extensive multiplication of instances of the same empty place can create a disturbing effect, as well as a paralysis due to the overwhelming quantity of information. Elahi builds a detailed metaphor of his daily routine in which images allude to his presence in his own self-surveilled life. These complex memory edifices are stored in minute and clearly defined lists. The lists are potentially infinite due to the fact that there is no hierarchical organization of information and there are actually no limits defined through frames of this online project. An important element of composition is rhythm which organizes the digital sequences in continuous visual flows.

On the other hand, rhythm shapes in a different manner the printed version of the project, organizing it mostly in the form of collections. Rhythm is closely interconnected in this case with framing. Whereas in the online environment there are no boundaries of the visual enumeration and the platformization of the experience practically allows the insertion of an infinity of elements, physical framing delimits micro-collections of spaces or objects from different contexts. These are collections of ordinary, banal

[8] Hasan Elahi. https://buffaloakg.org/person/hasan-elahi.

instances. The accumulation of these instances not only leads to saturation, but also to deindividualization and defamiliarization.

Factoriality[9], the part-whole relationship which may be conceived as the body being a part of the whole series of spaces, also presupposes a flow of perceptual perspectives and continuities interrupted by a border. Elahi's enumerative technique shapes a personal imagery with predictable series of sequences, a patterning of daily experiences in which his absence becomes like the absence of the camel in the Koran evoked by Borges[10].

Self-exposure can also be discussed as indicative of a paradigm shift which Elahi himself highlights twenty years after having had the idea of *Tracking Transience*:

> Nearly 20 years ago, people were looking at me like: Why in the world would you like to share all this information? And now people look at me like – I don't get it. What's the big deal? This looks like my Instagram feed.[11]

The statement is highly suggestive of the discrepancy between the perspective we used to have about privacy before the explosion of the Internet and the one we are currently having, as a consequence of the rapid transformation of the way we see things due to technologies. The notion of *semantic horizon* and the changes that it entails is extremely useful in explaining the articulation of a new perspective on the private sphere:

The semantic horizon is the set of cultural and fundamental knowledge that a person or a group of people has. This semantic universe can be implicitly or explicitly used by innovators, primarily through metaphor, to help give meaning to technologies, ultimately easing the integration of the new products into the user's understanding of the world. The result is that new technologies that do this successfully are far more likely to be useful because they are far more likely to be used[12].

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[9] Göran Sonesson differentiates between two kinds of indexical relationships, that is *factoriality*, referring to the relation from part to whole, or the inverse, and that of *contiguity*.

[10] In his essay, *The Argentine Writer and Tradition* (1951), Jorge Luis Borges advocates that the total absence of camels in the Koran shows the authenticity of the text; although from the horizon of Occidental culture, the camel seems characteristic of the Arabic world, the Arab simply takes it for granted, and so does not bother to mention it. This image is linked by Göran Sonesson to the a priori perspective that cultures assume when picturing nature.

[11] Hasan Elahi. https://buffaloakg.org/person/hasan-elahi.

[12] Inspired from Hans-Georg Gadamer's famous hermeneutical notion of "fusion of horizons", the concept of *semantic horizon* is developed by Eric Chown and Fernando

The semantic universe of the private sphere has undergone a complex and continuous transformation throughout time. Technologies have gradually introduced elements associated to the private sphere into the online environment. While analyzing this phenomenon, Elahi formulates the idea that there is no need to delete information anymore and makes a very suggestive comparison between information and commodities: the reason information has any value at all is the fact that no one has access to it. By giving massive access to information, this currency becomes automatically devalued. Whereas at an individual level the fact is symbolic, when it becomes a collective reality, the whole intelligence system needs to be reshaped in its most minute details. This new paradigm of self-exposure enhances the importance of interpretation in the treatment of information.

The multiplication of images in the online environment creates new forms of babelization and new challenges in selecting and interpreting overwhelming amounts of culturally connoted data. Images have massively replaced texts on online platforms, thus becoming a favorite communication tool. They can lead to conflicts of interpretation due to a vast array of implicit meanings that can be vehiculated by means of visual media. The concepts of personal archive and personal branding bring identity construction in a realm of visibility to a much greater extent than would have been possible in a non-digital environment.

4. Image and Text Interplay in Mishka Henner's *Putin's Prison*

Mishka Henner's *Putin's Prison* is a recent project which has resulted in a printed booklet with screen captures from unsecured surveillance cameras across Russia between the 3rd and the 4th of April 2022. The images display corridors, barriers, fences, entrances, shop interiors, parks, in which hackers replaced the usual data with anti-Putin messages and pro-Ukrainian slogans. The whole project is a metaphor of the vulnerable spots in the surveillance system. By introducing counter-narrative texts, the message is that of subverting the camera's ability to impose State control over citizens.

Mishka Henner is well known for this type of project resulting sometimes in print-on-demand books. His work is controversial, since he often appropriates and modifies images which do not belong to him. Starting from freely available imagery from satellites, such as Google Earth, then applying appropriation and erasure to famous photographies, such as the highly controversial *Less Americans* project, in which he modified 83 images from Robert Frank's classic book *The Americans*.

Nascimento in their book *Meaningful Technologies. How Digital Metaphors Change the Way We Tink and Live*.

Putin's Prison is based on a form of hacktivism[13]. The text insertions reconstruct the image, by creating a metaphoric mapping of its vulnerabilities. Through compromising the system coherence in accurately rendering what was happening in the surveilled spaces, the counter-narrative produces a disruptive and activist effect. The text resemantizes the images, endowing them with a new meaning, that of criticizing the war in Ukraine.

The narrative layering in this situation has at its core the manipulation of emotions central to state surveillance systems. A main idea in the study of security mechanisms is that they feed on anxiety and fear, on an entire emotional content, in order to exert control and belief in the existence of an inescapable reality. Propagandistic discourse relies on the same type of emotional construction. It amplifies the image of a vulnerable system, achieved through different types of media. The rhetoric and visual articulation of power dwells on triggering conceptual metaphors of fear and creating *regime-like media*: "The regime is, in other words, a forum for the circulation of power, and entails the possibility of management of emotions and subjectivity through the definition of what counts as threat and vulnerability" (Rose & Miller 1992: 281). The name of the project, *Putin's Prison*, is per se a visual metaphor for regime subversion. The captures are selected in such a way that they produce a panopticon effect through an architectural vertical dynamics, in which the vantage point belongs to the camera, to the observer.

The counter-narrative text insertions from *Putin's Prison* have a destructuring and subversive function. The technique consists in counter-mirroring the model of the propaganda structure in strata of discourse, dependent on one another in order to act as a whole and have the expected effect. The hacking dimension introduces a layer that destabilizes the whole organization and possible effects of the other strata of meaning converging into a semantics of power. The image reconstruction as an artistic procedure is part of a long history of appropriation. Playing is an extremely important part of appropriation and of the hacker ethics[14], which allows reinventing the rules of the game and inserting new layers of interpretation.

[13] According to Sofa Alexopoulou and Antonia Pavli, hacktivism is a term combining two actions, hacking and activism, and a concept that can also be linked to political activism. The purpose of hacktivism is to combine hacking tactics within the context of a political agenda; hacktivism also makes reference to any use of digital technologies for political reasons. (2019: 240)

[14] Pekka Himanen explains, in *The Hacker Ethic and the Spirit of the Information Age*, that the artist as a hacker inherits his mainspring from the figure of the pirate, who, even before being a copyright thief, is by his etymological nature an explorer, the one who attempts, assaults, and, above all, navigates (2001: 85–111).

The participatory dimension of the reception is of paramount importance. Thus, the public reshapes the emotional content based on fear into active paths which entail the subversion of the system. The project having a printed version can also be circulated as a booklet, another symbolic form of subversion. Printed forms obviate the minute control exerted through digital tools and media. The function of objects that escape digital monitoring may be essential in an informational war in which most of the propaganda rhetoric is shaped and amplified in the online environment.

Conclusion

Documentary surveillance photography is part of a deep social phenomenon of circulating and negotiating power. The subversion effect characteristic to this type of aesthetics derives from layered constructions and complex metaphorizations of situations and spaces, in order to generate new meanings filled with activist contents. Discourse practices are of paramount importance in conveying and constructing activist messages. They thus entail participatory experiences at the level of reception. The examples analyzed reveal different types of system subversion: from poeticizing dramatic situations to enlisting experiences of self-exposure and emphasizing vulnerable spots.

The elements of construction presented by Kress and van Leeuwen in *The Grammar of Visual Design* are central to corpus analyses. They are also well complemented by a theoretical framework mainly dwelling on Umberto Eco, Göran Sonesson and Roman Jakobson, as well as on a multitude of contemporary research papers on surveillance phenomena in general and surveillance art in particular. The artistic projects selected reshape the temporal and spatial dimensions of events through metaphoric layers in such a way so as to determine at the level of reception attitudes against oppressive and abusive endeavors. Subversion thus becomes an active phenomenon in the playground of reception.

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THE MYTHICAL AND TECHNOMAGIC AQUATIC METAPHORS OF DIGITAL AESTHETICS AS A SEMIOTIC EMPOWERMENT OF THE FEMALE, ONEIRIC, AND TRANSLUCENT IMAGINARY IN THE TECHNO-ART

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Abstract

This essay aims to reflect critically on how the technomagic concept, elucidated by the French philosopher Michel Maffesoli, proposes itself as a new way of understanding the contemporary aesthetics of the digital based on the immersive visual effects of liquid, dreamlike, and ethereal poetic sounds and visualities present in several examples of artistic contemporary productions. This philosophical and aesthetic perspective, brought about by technomagic evocates liquid and aquatic metaphors of digital artistic creations, as well as a way of understanding social human relationships in the digital sphere in an optimistic context of re-enchantment for human

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existence. For him, it was a process of feminization of the world, evocating mythical metaphors of cultural imaginaries and symbolics. Methodologically, this work intends to contemplate cultural semiotics as an enlightening approach by understanding digital culture as technological mediation for analyzing digital language which reflects the paths of technomagic in the expressions of technological art characteristics of digital media.

Keywords: aquatic digital metaphors, cultural semiotics, technomagic and dream aesthetics, feminitude, sacred, re-enchantment of the world

1. Introduction

The constant use of female metaphors in many expressions of digital art, such as music, video, poetry, movies, and visual arts, creates a special dimension for observing a cultural phenomenon. Some philosophers, such as Michel Maffesoli (2009a, 2011, 2014), consider this to be "a feminization of the world." This feminization of the world finds essential support in the imaginary theory of Gilbert Durand (1992).

Contemporary times demand that more suitable theories be applied to update these conceptions, in such a way as to observe the complexity of feminization in art, especially in digital art.

Notably, a conceptual interrelationship between Tofts' Medea theory (2004) and the foundations of Maffesoli's technomagic (2011) enables a more complex and meticulous understanding of the paths of contemporary digitality in aesthetic-philosophical terms.

On the other hand, such conceptual interlocution produces interpretive elements of critical-aesthetic analysis which try to accompany the rapid process of transmutations of art and future speculations on the fate of technological art related to the field of gender studies.

The field of art in cyberculture has become a fertile ground for experimenting with new sensory incursions and exploring innovative and disruptive high-technology elements, in order to configure new aesthetic sensibilities and sociability in the digital sphere, considered a virtual, interactive, and immersive universe.

Some artists have become masters of taking significant advantage of the digital technology concepts of mixed, hybrid, liquid, and augmented reality technologies in such a creative and innovative way as to provoke new types of reflective questions about the challenges of the highly technologized and dehumanized contemporary world.

In addition, they attempt to resume disquieting and disruptive attitudes and strategies to awaken human beings to a new step of awareness of humanization through critical technological thinking.

2. The Interconnectedness Between Technomagic and Digital Aesthetics

Currently, liquid metaphors and allegories populate ambiguous images which serve as semiotic strategies aimed at understanding the emerging and disruptive digitalization phenomenon in terms of its broad aspect of complexity. They also have assigned interpretative elements both to positive and negative the quotidianization of digital technology regarding the diversity of commonplace social, interactional, and affective human relationships.

Opposing this idea, based on the studies of cultural imaginary and symbolic hermeneutics of Gilbert Durand (1992), the French philosopher Michel Maffesoli tries to rescue the liquid metaphors notion as a universe belonging to the ancestry of the mythical feminine.

In this context, he emphasizes the transformative and liberating power of affection, welcoming others (alterity), and ecological awareness, challenging the values inherited by patriarchal, dogmatic, hierarchical, colonizing, oppressive, and phallocentric conventional principles.

From the perspective of gender studies, Maffesoli's idiosyncratic phenomenological perception of the concepts of feminine, femininity, feminization, invagination, and evagination conceives the culturological vision of women as beings of unnamable and ineffable singularity. In this aspect, his vision is endlessly dissociated from the stereotypical idea of fragility and naivety, to give it a meaning of strength, intelligence, reluctance, resilience, determination, cunning, and, in the same way, empathy, intuition, sensitivity, creativity, and innovation.

Through this train of thought, he proposes the plastic notion of a re-enchantment of the world about the digital universe, based on ideas arising from magic and the mythical imaginary of the ancestry of the female figure which populates several ancient and millennial cultures. With this sense, he seeks to add a transformative critical optimism to the role digital culture and aesthetics can play in people's social lives, by cultivating values, feelings, and constructive attitudes in the face of everyday changes.

The philosophical technomagic concept (*Technomagie*) proposed by Maffesoli (2011) elicits symbolic analogies between the modes of digital media interpretations with different archetypes related to magical knowledge.

For him, technomagic relights the role of techniques in the dawn of fantasies, dreams, and re-enchantment of world existence through the dimensions of magic, illusionism, and imagination.

In addition, digital resources and environments make it possible to realize a virtually imaginable and technologically achievable oneiric and ethereal world.

In other words, that which was often conceived in the field of the creative imagination of science fiction literature and experimented with in the sense of modern visual arts, comprising a surreal nature, comes to have concrete possibilities of high-technological audiovisual representation.

Given the virtual reality term, one must first understand its mistaken conceptualization, considering that there is no reality created by digital technology dissociated from the everyday lives and sensitive reality of human beings. Therefore, the most appropriate term would be expanded reality or mixed reality, in which the reality mediated by digital technology complements and extends the perception of an existing concrete reality.

In this case, technological virtuality represents material reality's transformative and updating potential transposed to mediated and symbolic immateriality.

In this aspect, liquid metaphors guide the perceptive relationship with the dynamic, mutable, morphogenic, and transfiguring nature in which interactivity, immersiveness, and sensorialization emanate when the sensitive and social experience is made present, instantaneous, and accelerated due to the continuous contact with contemporary digital technological devices.

Complementarily, such disruptive digital turns produce technological implements with the great power of acuities by the special visual and sound effects techniques improvement. This has been widely used by artists engaged in digital technology, in order to conceive new types of transcendent, dreamlike, and ethereal sensibilities, whether from images, video clips, cinema, or electronic music.

Following a tradition of thinkers and philosophers reflecting the sense of interconnectedness as applied to magic and technology with regard to new advanced implements, Maffesoli's technomagic (2011) corresponds to a paradox between the new and the old, incorporating the archaic ideas of magic and myth. Thus, it symbolically represents that which can be used to create unforeseen relationships with the world, from empirical subjectivity (*mesocosms)* to environmental objectivity (*macrocosmos*).

Therefore, it is what exists between the subject and the world, and it develops a sense of a mediating role regarding social interaction relations with an ethical and aesthetic background for existential life.

Neveretheless, giving greater depth to reflective issues, technomagic also indicates a field of art expression made from the so-called new techniques of poetic creation of imaginary realities. This allows the multisensory and kinesthetic representation of the world through mythical, fantastic, surreal, and techno-futurism, all concepts inserted in cyberculture studies, which broadens the focus dimension of the creative process of digital culture.

Maffesoli (2009) also adds to the relevance of the contemporary perceptual movement of feminization of the world, based on symbolic ancestral feminine elements such as alterity or otherness, the spirit of welcoming (host, reception), the sensitive and affection atmosphere, the maternal disposition, the connection with nature, the night symbol, the dimension of mystery, the meditative spirit, the lyrical and the profane (mundane), all quite explored in several technomagic artistic productions with digital technologies.

On the other hand, Durand (1992), who was, in some sense, the master of Maffesoli, conceived certain main female metaphors of the symbolic imaginary, such as water, stream, river, crevice, cave, and music, among other elements, always evoking the forms of nature, and evolving the movement between the interior and exterior world as well as their complex interminable dialogues, in terms of the essential human creative spirit.

As Durand's disciple, Maffesoli (2009) continues his work, following the same approach as the symbolic imaginary, by reinforcing the relevance of female metaphors in contemporary times.

Each of these allegories, which can also be interpreted as continuous metaphors of meanings that do not fade away but remain even in the semiotic fabric of textual, sound, and image fragments, bring fertile interpretative itineraries to the sense of digital art.

Digital technologies, with their role of remodeling information, make it malleable, adaptable, and transformative. They also acquire liquid and circular aesthetic characteristics to the radiated incarnation of multiple convergences through feedback, iteration, and recursive computational propriety elements.

Some of the most common liquid and circular metaphors used to interpret the aesthetic phenomenon of digitalization are foams, spheres, swirls, spirals (Santaella 2007), and amniotic fluid (Assmann 1999), symbolizing softness, interpenetrability, permeability, circularity, involvement, gestation, and fecundity.

Such interpretive metaphors make it possible to form conceptual bases to conceive digital media aesthetics and philosophy, as well as the conceptual definition of what defines the cyberculture paradigm.

For Durand (1992), these and other images, such as night, hollow, colors, rock, wig, fruit, and warm, characterize the level of penetration (or interpenetration), as well as interaction (re-interaction), elaboration (re-elaboration), knowledge (connoisseur), and power (empowerment, empowered, empowering), among other possible symbolic hermeneutic correlations.

In addition, Durand (1992) also denotes how music, transcending these imaginary allusions, symbolizes the figure of a woman undressing herself, showing and hiding her face and body, in an allusion to the image of the Greek myth of Aletheia – the game of veiling and unveiling the truth. Music also condenses mathematical logic (meticulous rationality) with creative sensitivity, in a rhythm of notes that denote a continuous game between reason and emotion.

The myth of the woman hiding her face and body is quite recurrent in several contemporary philosophers, such as Emanuel Levinas, who studied the face of another as infinity and an encounter; and Jacques Derrida and Jean Baudrillard, who explored the themes of the other and the otherness, in the senses of searching for alterity and radical alterity.

These philosophers worked on the philosophical and aesthetic concepts of femininity to express the illusory dichotomous frontier between reason and emotion and sensitivity and affection, thus demonstrating a fine and crisp line in the tangled dialectical game of becoming a human.

According to Santaella (2007), liquid concepts permeate the thinking of several contemporary thinkers and philosophers whose approaches are in tune with philosophical and aesthetic issues about digital phenomena.

Among these contemporary thinkers, Bauman, Deleuze, Guattari, and Maffesoli stand out. Regardless of their distinct elucidations, each of them, in their idiosyncratic manner, expresses liquid content as something which does not keep in its shape easily. It does not fix either the territory of space nor does it try to imprison the movement of time.

Following this idea, physical, spatial, and time forms become radically changeable without definite solidity. The liquid metaphor dissolves all of the properties of perennial, durable, and permanently cemented. The liquid concept evolves into a phenomenon of continuous undoing of irremediable and uncontrollable becoming.

Conceptually, the liquid form of nature can conform to other forms, with a tendency to alter its nature to fill it, even for a simple instant. This makes it similar to the digital nature of information represented by texts, images, sounds, videos, etc. In this way, liquid shapes represent symbolically the complete dissolution, melting, diluting, liquefying, and fading away, from static forms of nature and culture.

For example, the dissolution and decomposition of meta-narratives and the conceptual canons often used to interpret the human condition and essential human values become discarded, since liquid shapes refer to the flexible transition from fixed borders to de-dogmatizable borders. In this sense, it substantiates the intermittent passage from prose to poetry, from reality to fiction, from static to dynamic, from passive to active", glimpsing the human activity" which combines science and art, the mundane and the spiritual, the contingent and the permanent[1]" (Novac *apud* Santaella 2007: 16)

Within the same context, another philosopher who works conceptually with liquid metaphors is Peter Stoterdijk (Santaella 2009: 19). In his trilogy *Sphären* (Spheres), he also deals with a metaphorical concept very close to the notion of "liquidity."

Nevertheless, in the third volume of the Spheres, entitled *Schäume* (Foams), the author sketches something even more subtle, delicate, complex, and lighter than that which the liquid content is supposed to be through its plastic and metamorphic composition.

To a certain extent, throughout his conceptual approach of *Sphären* (volumes 1, 2, and 3), Sloterdijk (2004) focuses on the senses and sensations of space, lived and experienced by human beings, in its broadest aspect.

Passing from the symbiotic relationships between mother and child, and going through mystical and religious experiences, love stories, experiences in the family nucleus, and the sense of affection, solidarity, intimacy, and welcoming, this philosopher connects several female and liquid metaphors, at once.

Another liquid approach comes from conceiving a porous dimension and a bifurcating reality, with the metaphoric image of continuously running water, reflecting the perspective characteristic of a very dynamic process.

In this sense, the French philosopher Sarah Kofman (1983) formalized the pore theory as a liquid and dynamic potency in terms of the Deleuzian meaning of rhizome and nomadism, as radically free, plastic perceptive dynamics, unrestricted by physical, cognitive, sensitive, and epistemological barriers.

For her, pores refer to a maritime or fluvial route which opens in the direction of travel, conditional on turbulence and a chaotic expanse of indetermination. However, the image of pores can also get the power to turn an unpredictable route into a very qualified and visible space. This is Deleuzian eventfulness with the potency to provoke unthinkable sensations, feelings, emotions, and inner effects.

[1] My own translation of the book, which was originally written in Portuguese.

In these terms, the sea symbolically conceives the potentiality of pure endlessness and emotion, maximum mobility, continuous alternation, spatial polymorphism, and obliteration of paths.

On the other hand, it also has the power to turn such a route into a qualified space, as long as different paths and directions emerge in its extended space, a very skillful strategy to face the adversities imposed along the way (*aporia)*.

On the other hand, the sea comprises even the field of infinity in terms of pure motion, maximum mobility, continuous alternation, spatial polymorphism, and obliteration of paths, making each journey an unprecedented way of exploration. It is at the same time both uncertain and dangerous, but in the direction of an unexpected and amazing destination.

Nevertheless, the ocean contemplates the inexplorable immensity of the outer and inner world, the physical and metaphysical world, the immanent and the transcendent, the corporeal and the incorporeal, representing the transition from analog to digital.

All these illuminating metaphors of the mythical female correspond to contemporary attempts to understand what digital phenomenon is, considering its ambiguous nature, with its media convergence potency.

The ambiguity and opacity characteristics of digital media also reveal its capacity to reiterate technological manipulability, allowing filtering, copying, cutting, and pasting of a great variety of storage data, with several possibilities of aesthetic recombination.

Finally, the digital language genre represents old forms entirely remodeled, composing a hybridizing whole, which establishes the conceptual division between analog and digital, that is, between the old (traditional media) and the new, which is the updated old media that does not cease to create new re-transfigured shapes.

3. Liquid Metaphors in the Context of Digital Aesthetics

To a certain extent, the current moment demands theoretical-methodological connotations which lead us to multiple references in the context of communications and arts, sometimes complementary or dissonant, seen as a strategy for taking the complexity of cosmopolitan and culturally diverse human scenery.

Cosmopolitical approaches to art demand that the expression of art be engaged in anti-homogenizing potential attitudes to consider the possibilities of mutual coexistence, and the learning to live in contexts with difference, diversity, and otherness.

By following this understanding of conceptions of art, technology, seen as a medium of language and some experimental support, can potentially create new horizons for establishing sustainable relationships with otherness.

Medea Theory, advocated by Tofts (2004), creates potential thinking for ambiguous complexity regarding the conventional term of Media Theory.

Medea theory evokes the feminization of the world of communication and the idiosyncratic aspects of digital communication, in which the field of excessive rationality gives rise to the playing of sensitivity and sensation.

In this way, the obstinate desire of man to control the world, nature, and culture, to systematize a definable and predictable universe, is then replaced by the vastly uncontrollable and unpredictable aspect of human subjectivity.

Nevertheless, the field of the compulsive interpreting attempt, as represented by several hermeneutic approaches, defined by Deleuze as *interpretose* (pathological interpretationism), comprises a search for an absolute understanding of everything as a sense of real and absolute truth.

On the contrary, the Medea theory gives rise to the field of dynamics of mystery and wide-open incomprehensibility.

It is based on the poststructuralist logic of conceptual displacements, in which there is a great circularity of ideas and values, continuous processes of alterity, and several "track games", as pointed out by Jacques Derrida, obeying the complex interaction of non-linear elements.

In addition, it also characterizes the present moment in which the communicational understanding comes to such an impasse that the only thing left is silence. Therefore, the Medea theory is also distinguished as an aesthetic of silence.

By adding complementary ideas, Novaes (2014) says that the current time is represented as too much talking and an exacerbation of pure gossiping.

In this aspect, both the themes of silence and prose are usually not treated as relevant objects of intellectual reflection, making us think about some speculations regarding this cultural phenomenon, present in contemporary life experiences.

Novaes (2014) also stresses that, in general, some theorists are used to giving more importance to what they consider some higher issues, such as the destiny of humanity, the moral rules, the political ideals, and the problems related to human existence, thus developing pure abstractions of concepts without considering the concern with commons things of the world.

The problem is that new technologies have given us too many opportunities to speak, talk, and express ourselves, showing our feelings, emotions, disappointments, affections, anger, and hate from a global interconnected perspective.

This reflects an endless communicational paradox in which a world permeated by so many communicational apparatuses reflects the incommensurable phenomenon of incommunicability reiterated between human beings at all times.

In this sense, most of the time, that which characterizes the human relationships of mediated and non-mediated contact is complete incommunicability, rather than communication in the sense of humanized relations between humans.

This is why silence ends up as being an extraordinary experience of introspective insights to mainly recover the sensitive meaning of the world, even in the greatest simplicity of things, which defines a human relationship as an affective context of being and becoming.

Following this train of thought, without silence, it is sometimes impossible to understand the discourses of someone, because the experience of silence brings us the necessary time for thinking and the possibilities of very refined reflections.

Information technologies produce endless amounts of new words because of the resources of technical languages, constantly shared through Facebook, Twitter, blogs, cell phones, online chats, lives, etc., in a continuous transmutation and remediation of forms. This implies even more forms of technical languages and emerging expressions of words, including the GenAI rising.

According to Novaes (2012), maybe the most relevant question concerning this amazing techno-cultural phenomenon is the relevance of silence in creating works of art and introspective re-thinking.

In this way, the constant mutations of silence concerning cultural and societal development must reflect the search for new attitudinal postures regarding the symbolic construction of senses, thoughts, languages, and ethics applied to new horizons of culture and art.

Complementarily, this evokes an aspiration for improving the notion of a listening pedagogy related to how we deal with the completely alien, represented by the strangeness one can feel about otherness, rejecting what it is incapable of understanding in part.

Still, according to Tofts (2004), in the digital scenario, the transitive theory of mediation in the sense of Medea theory aspirations, should be replaced by the transversal theory of "medeation". This implies a new theory

of symbolic constructions and relations established from the insertion of the world of cyberculture into social quotidian life, much influenced by the context of the feminization of the world.

4. Mythical Metaphors and Digital Atmospheres

For Maffesoli (2011), technomagic is a way of thinking aesthetically about how digital techniques, with their plastic special effects, transport us into imaginary worlds which provide a re-enchantment of human existence.

In this context, it is a process of complete feminization of the world, involving the sense of evagination (exterior protection) and invagination (interior reception) of humans at the same time, that is, the maternal symbolism of involvement, welcoming, care, and affection, in that which he defines as full *feminitude*.

As said before, the term "feminitude", coined by Maffesoli, is entirely distinct from the term feminine or femininity, since for the philosopher it is a process in which men along with women also participate and actively engage.

For him, this view dissolves dogmatic distinctions between an essentially feminine being, feeling and acting, and an essentially masculine being, feeling and acting. In this respect, the extremely distinctive dichotomies dissolve themselves, giving rise to another understanding of what it is to be human in its complexity and diversity of feelings, actions, and existentialities beyond heteronormative and cisgender assumptions.

This process also characterizes itself by the growing sensitivity to ecological awareness. Furthermore, it brings to light the revaluation of values denied to adult life, and entirely present in childhood, such as games, creativity, pleasure and joy in life, playfulness, and dreams.

For Lucia Santaella (2007), the Brazilian semiotician, liquid metaphors are components of digital aesthetics, whereas for Durand (1992) liquid metaphors refer to the mythical feminine of cultural imagination.

In this way, technomagic is also a concept which helps us understand how the magical power of technical images and ethereal sounds can reveal a spirit of transcendence hyper-reverberated in the couplings of multiple senses with layers of resonances and dissonances of the aesthetic imagery background.

In this context, cinematic special effects are vivid examples of how digital technology can be applied to create a fantastic world of beauty and enchantment in an intrinsic relationship between sacred and digital tech-

niques, as presented in Avatar (2009), the Star Wars franchises, Harry Porter, The Lord of the Rings, and many others.

The ethereal and misty digital atmosphere of musicians such as The Cocteau Twins, Sigur Ros, Bjork, Nick Cave and the Bad Seeds, among others, cherish ambient sounds which evoke the dreamlike, the transcendent, the spiritual, the ecology, which are hallmarks of technomagic and femininute, philosophically and aesthetically foreshadowed by Maffesoli.

Both in their sound and their music video, these artists like others work with enlightening imagery sounds and sonic images in line with poetic backgrounds which envision strategies for contemplating technomagic liquid and aquatic metaphors.

Each of them works on the intimate interrelationship between the philosophy of the sacred and the aesthetics of feminization in the digital, extracted from their music videos.

In the present times, the growing of contemporary immersive art installations, and the immersive revisiting of artists, such as Van Gogh's expositions of art, in a digital interactive immersion, are also samples of technomagic art.

Before this, liquid and circular metaphors assume a meaningful role in the perception of science, technology, and arts. In this sense, symbolic images of foams and spheres reflect the feminization of several expressions of art, including music, video, and dance.

As Santaella (2007) points out, like other thinkers, symbolic images of swirls and spirals reflect elements for interpreting and understanding aesthetic signs and symbols in several expressions of art, including dance art.

On the other aspect, Durand (1992) elucidates images, such as night, hollow, colors, rock, wig, fruit, and warm, establishing a level of penetration and interpenetration in terms of inter-psychic and intra-psychic symbolic elements.

In addition, he also denotes how music, transcending the imaginary allusions, symbolizes the figure of the woman who undresses herself and who shows and hides her face and body, in allusion to the image of the Greek myth of *Aletheia* – the game of veiling and unveiling the truth.

Santaella (2007) emphasizes that liquid concepts permeate the thinking of several current authors, in tune with questions about the digital phenomenon, such as Bauman, Deleuze, Guattari, and Maffesoli, among others. In their different elucidations, each of them, in their particular way, expresses the liquid content as something that does not keep its shape easily, as it does not fix the territory of space and does not try to imprison the movement of time.

In contrast, the liquid aspect conforms to other existing forms with a tendency to alter their nature to fill it, even for a simple instant. In this context, liquid metaphors represent the present moment, when the meta-narratives and the conceptual canons, used to interpret the human condition, are even discarded. That is because liquid forms refer to the transition "from prose to poetry, from reality to fiction, from static to dynamic, from passive to active," "glimpsing the human activity" that combines science and art, the mundane and the spiritual, the contingent and the permanent" (Novac *apud* Santaella 2007: 16).

Following the same line of reasoning, another philosopher enunciated by Santaella (2007: 19) is Peter Sloterdijk, with his trilogy Sphären (Spheres). In this collection of books, Sloterdijk deals with a metaphorical concept very close to the notion of "liquidity". For instance, in the third volume of The Spheres, entitled Schäume (Foams), the author sketches something even more subtle, delicate, complex, and lighter than the liquid content is supposed to be in its plastic and metamorphic composition.

To a certain extent, throughout his Sphären (volumes 1, 2, and 3), Sloterdijk (2004) seeks to focus on the senses and sensations of lived and experienced space by human beings in their broadest aspects.

This emerges from the symbiotic relationships between mother and child, passing through mystical and religious experiences, such as love stories and experiences in the family nucleus, and finally to a sense of affection, solidarity, intimacy, and welcoming.

In all these cases, the idea of reinforcing the dimension of a porous and bifurcating reality is underlying, which contemplates plural investigative options in the communicational and artistic fields from a more dynamic investigative perspective.

As previously pointed out by French philosopher Sarah Kofman (1983), porous, for her, is a powerful symbolic image referring to a maritime or fluvial route which opens according to the travel route, and is subject to turbulence, recesses, and inevitable chaos.

Nonetheless, the porous also has the power to turn such a route into a qualified space, as long as different paths and directions emerge in its extended space. In this case, the sea symbolically represents a field of infinity in terms of pure motion, maximum mobility, continuous alternation, and spatial polymorphism.

This can also be interpreted as the obliteration of paths, making each passing way on an unprecedented journey of exploration. At the same time, it may be eventually uncertain and dangerous, but coming in the direction of an unexpected and amazing destination to finally get through.

Complementing such approaches, Medea Theory, proposed by Tofts (2004), evokes the feminization of the world of communication and the idiosyncratic aspects of the digital communication context by changing the field of excessive rationality by playing sensitive and sensory characteristics.

In this case, the presumed intent is to contest the obstinate desire of the control of man, and the idea of systematizing a definable and predictable universe, to be replaced by the vastly uncontrollable and unpredictable aspect of human subjectivity.

5. The Semiotic Empowerment of Multiple Signs in the Digital Techno-art

From a cultural semiotic reading, technomagic digital aesthetics serves as a game between the transcendent luminous, the mysterious opaque, and the gloomy dark, to reveal unusual games of interpretative paths which constantly interconnect the field of the sacred with the field of the profane, through the vein of feminine cultural mythical imaginary ancestry.

In these terms, several complementary reflexive approaches can be used to conceive the gesture of art, symbolizing the subjective and collective contact with art in a transformative act of living with otherness.

For example, according to Medina (2006), cultural reading refers to poetic openness to creativity regarding intuition activation and interpretive insights.

In this aspect, the Brazilian semiologist and communication epistemologist, proposes concepts of modern physics, such as inter-conditioning subjects (reversibility process), intercausality, porous universe, mass in transformation, complexity, different senses of the same reality, and coherence notion instead of right and wrong judgment.

For her, this great variety of concepts enables us to perceive the experience of art as an interconnected experience with the complexity of otherness, in terms of an attempt to acquire some little but substantial comprehension of its co-existence.

The sign of relationship (2006), conceived by her, represents an attempt to establish a dialogical relationship between different intellectuals, scientists, artists, educators, and journalists, to surpass the ethical, technical, and aesthetic atrophies, which do not give support to the collective demands of contemporary times. Therefore, it supposes an invaluable strategy for conceiving art as a dialogical cultural mediator in the context of otherness.

On the other hand, Maria Teresa Cruz (1986), the Portuguese cultural semiotician, argues that all kinds of arts are continuously recreated, always becoming a product of interaction between artistic expression and public contact (reader/listener/viewer).

She calls this the "aesthetics of reception" and "poetics of reception". In her cultural reception ideas, the sign is not a closed system, given by the author's intention, or only decoded by a critical specialist. In contrast, a sign is an unpredictable event generated by the public's encounter with artistic expression.

Still, according to her (1999), the vanguard of the arts completely transformed the role of artists by giving possibilities to anyone being an artist, leaving the traditional place occupied by the artists empty. This creates the real possibility for reinventing art and intervening in the real world. However, considering that art is a humanizing gesture, not everything remains open, once art also creates possibilities for infinite games in the frontier between opening and closing, finitude and infinitude, possibility, and realization.

With this aspect, Trinca (2006) conceives what he calls "the aesthetics of the infinite" as a way to connect oneself to intuition. For him, it is only possible to gain a certain glimpse of endlessness, that is, a vague apprehension of the indispensable itself, after the obliteration of things which appear suddenly and disappear in sublime awakening.

In other words, one can describe the world because the infinite is a manner of saying that something touches the unknown, and then, by this fact, one can experience a feeling of a state of "liquid" that changes the sense of space and time as categorical imperatives.

Santaella (2003) advocates that cyberculture cannot be thought of only in terms of new high-technology developments, especially related to the restriction of computational and teleinformatics concepts and the emergence of new possibilities of sociability.

For her, cyberculture also involves a wider context of the post-human, which implies that it must be thought of from some perspectives of the biotechnological arguments too, whose elements are creating a new kind of bio-sociability. In this context, biotechnology is designing the emergence of a new order for producing life, nature, and bodies through technological interventions based on new paradigms of biology.

Conclusion

This work tried to attest how technomagic and Medea theories are concepts which can help us understand certain symbolic feminine metaphors, such as music, silence, poetry, changing forms, liquid signs, and the spirit of ethereal, among others, frequently present in digital expressions of art.

The recurrent use of these feminine metaphors is present in different forms of contemporary art expressions (music, visual arts, poetry, videos, science fiction movies, series, etc.), and it reveals that great effort is still necessary to make contemporary art experience with high technologies more comprehensive to a large audience.

Considering that the world is going through a process of feminization of culture, according to Maffesoli, it can be speculated that the future of art is also in feminization, with its symbolic imagery and mediations which may guide the paths of innovation and creation in search of new empowering and libertarian shapes of artistic expression.

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CONCEPTUALIZING DIGITAL REALITY THROUGH METAPHORS IN PUBLIC SERVICE ANNOUNCEMENTS: A SEMIOTIC PERSPECTIVE

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Abstract

This article discusses the conceptualization of digital reality through metaphors in public service announcements (PSAs), employing a semiotic perspective. PSA is viewed as a complex sign in the space of culture generated by social institutions to be shared with the general public and to raise awareness about important issues of society.

The discussion is based on three basic claims: firstly, as digital reality increasingly spreads throughout modern life, digital technology shapes how we understand and experience the world and profoundly alters meanings and cognitive structures; secondly, the creation and reconfiguration of meanings and cognitive structures caused by digital artifacts occurs through metaphorization processes resulting in the creation of digital metaphors; thirdly, digital metaphors are the driving force behind creation and a way of producing original PSAs and display commitment to innovation reflected in the selection of signs.

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The article proposes a theoretical framework that integrates the concepts of "digital metaphor" and "representation" in Peircean view, thus creating a semiotic perspective of interpreting the "discoverability" i.e. public perception and comprehension of PSAs.

Special attention is paid to the multimodal nature of the complex cultural signs under study and the representative characters of different representamens. The analysis of some PSAs containing digital metaphors is provided to substantiate the potential of the suggested theoretical framework.

The article draws inspiration from works by Charles S. Peirce (1903), Umberto Eco (2014), Ibrus Indrek and Peeter Torop (2015), Kristian Bankov (2022), Eric Chown and Fernando Nascimento (2023), and others.

Keywords: digital reality, digital metaphor, public service announcement, complex cultural sign, multimodality, representation

> Sign production involves the adventures of sign or signs
> (Hugh J. Silverman)

1. Exploring Digital Reality: Foundations and Semiotic Insights

1.1. Understanding Digital Reality

Present-day society has become digital. Because of technological advancements, digital reality has affected numerous spheres of human existence and has called for new approaches and methods of creating and interpreting diverse texts borne by this reality. The latter emerges as a multifaceted phenomenon that brings together different digital technologies, virtual environments, and human experience, blurring the distinctions between the physical and virtual realms. Therefore, being innovative and multifacet, digital reality provides new objects for interdisciplinary research:

> "The new era of global, digital, networked and transmedial cultures, and their visibly dynamic change has, however, again brought about new perceptions of the value of interdisciplinarity" (Ibrus & Torop 2015: 4).

Though technical domains such as computer science and engineering remain basic for the study of digital reality, the latter significantly engages social sciences and humanities. Psychologists study the cognitive and emotional impacts of digital phenomena; sociologists and anthropologists explore their cultural and social implications; media and communication studies analyze changes in media consumption and storytelling; education

researchers investigate the potential of digital realities for innovative learning and training approaches and more.

Digital reality, as a new space of sign reality, revolutionizes the use and interpretation of language because natural language signs merge with visual, auditory, and other non-lingual codes, creating multimodal forms of communication that transcend conventional text. Those revolutionary changes call for new approaches to discourse studies as new modes of discourse emerge. Semiotic theory views the text as the space of sign reality. With the emergence of digital reality the sign reality of texts has been modified and semiotics has become a powerful tool for their description.

Reconfiguration of sign systems and meaning-making processes within digital reality has sparked the interest of researchers. Lev Manovich in *The Language of New Media* (2001) examined the semiotics of digital media, highlighting how new media technologies create new forms of visual and interactive signs that alter traditional signification practices. Marcel Danesi in *The Semiotics of Emoji: The Rise of Visual Language in the Age of the Internet* (2016) studied how emojis and other visual signs are integrated into digital communication, forming a new layer of semiotic complexity. Sara Cannizzaro (2016) analyzed Internet memes in new media communication. Kristian Bankov in *The Digital Mind: Semiotic Explorations in Digital Culture* (2022) explored how digital environments alter traditional semiotic structures, emphasizing the dynamic nature of digital signs and their role in shaping contemporary culture and cognition. These are but a few researches having reference to some issues of encoding digital reality. The very notion of the latter does not have its final definition yet.

Different researchers offer diverse definitions of digital reality. Digital reality is a general term for all kinds of immersive experiences, including virtual reality, augmented reality, mixed reality, and extended reality (Ebbesen & Machholdt 2019 n.p.). The majority of scholars agree that digital reality refers to the wide spectrum of technologies and affordances that include virtual reality and augmented reality. Virtual reality is a computer-generated environment, and augmented reality is a combination of the physical and digital worlds (Nijenhuis 2023 n.p.). In virtual reality, users find themselves in digital spaces that go beyond mere entertainment or technological innovation. Technologies enable individuals to engage with virtual digital reality through immersion in the designated environment, for example, virtual tours and excursions. Augmented reality provides the ability to combine digital information and the physical world and enables the simulation of a scenario or experience. For example, we are all well aware of the reason why people do not always want to rent commercial real

estate online: it is difficult to imagine whether the premises will meet the commercial intent. However, now, with the use of mixed physical virtual reality, owners can help buyers design the placement of equipment in a proposed space so that clients can understand whether it suits various parameters for their business purpose.

Applying the semiotic perspective, we can venture the definition: digital reality is a multimodal environment formed by a set of signs of different types, the objects of which belong to virtual, augmented or physically mixed virtual reality.

1.2. Metaphors in Digital Reality: Semiotic Perspective

Digital technologies are a source and a product of inspiration, as they provide new ways of creating, transmitting, and perceiving information. Simultaneously, digital technologies not only enhance communication tools but also generate new meanings, altering our perception of things. They "not only produce new tools and social structures, but they produce new meanings; they change how we see things" (Chown & Nascimento 2023: 2). Meanings and cognitive structures are profoundly altered through digital technologies. Digital artifacts create and reconfigure meanings and cognitive structures primarily through metaphorization processes resulting in the creation of digital metaphors. Discoveries are supposed to be cast in terms of things that everyone understands and the primary vehicle of this strategy is most commonly a metaphor:

> "Today, however, it is scarcely an exaggeration that metaphor is more respectable than rhetoric itself <…> Today metaphor is no longer one figure among others but the figure of figures" (Culler 2001: 210);

> "Metaphors are privileged ways in which language and technologies blend. Metaphors can be used to create new meanings and are therefore an essential mechanism when developers want to introduce a new technology through language" (Chown & Nascimento 2023: 27).

It is generally acknowledged that the term "metaphor" is used to describe a correlation between distinct ideas, thoughts, and emotions, wherein one idea or emotion leads to another. Different concepts and approaches have been developed to explain metaphorization. Linguists apply the notion of association and define metaphor as a method of conceptualizing reality by interpreting the essence of one sphere of human experience in terms of the essence of another (Martyniuk 2011: 74). Thus, one concept serves to structure another one through associations based on similarity.

Olena Selivanova emphasizes the semiotic nature of metaphors and considers them to be a manifestation of linguistic economy and semiotic laws (Selivanova 2008: 97).

The semiotic view on metaphors suggested in this paper relies on the semiotic doctrine of the American logician and semiotician Charles Sanders Peirce (1839–1914), who considered a sign to be an inextricable connection between a representamen, an object and an interpretant (Peirce 1991: 28). To denote *a sign*, Charles Peirce initially used the term *representation*. When considering various instances of the action of a sign, Peirce paid special attention to the interpretant:

> "every comparison requires, besides the related thing, the ground, and the correlate, also a *mediating representation, which represents the relate to be a representation of the same correlate which this mediating representation itself represents*. Such a mediating representation may be termed an *interpretant*" (ibid.: 28).

Charles Peirce categorizes signs into three types based on their relationship with the object:

> "the first is the diagrammatic sign or *icon*, which exhibits a similarity or analogy to the subject of discourse; the second is the *index*, which like a pronoun demonstrative or relative, forces the attention to the particular object intended without describing it; the third is the general name or description which signifies its object by means of an association of ideas or habitual connection between the name and the character signified" (Peirce 1993: 243).

Speaking about metaphors, Peirce remarks that they reveal parallelism with something else (The essential Peirce 1998: 273–274). He defined metaphor as a new sign relation and, consequently a new thought. Thus, the semiotics-oriented definition of metaphor based on Peircean doctrine should emphasize that: a) metaphor represents triadic relation between representamen, object, and interpretant, b) the object possesses marks of similarity with another object for the interpreter and c) the interpretant reveals the relation between the representamen and the object shaped by the similarity mentioned in b). The definition holds for a digital metaphor. Its representamen belongs to digital reality and object – to physical reality. The interpretant establishes their similarity.

Digital metaphors are crucial for increasing the efficiency of communication in public service announcements (PSAs). They are the driving force behind creation and the way of producing original PSAs. They are often

encountered in the form of iconic signs. This facilitates the perception of the text and displays the commitment to innovation reflected in the selection of signs. Moreover, visual iconic signs attract the audience's attention and deepen their understanding of complex social problems. In particular, digital metaphors can evoke emotional responses of compassion, outrage, or hope, as well as attract viewers and make the advertising message memorable. A wide range of digital metaphors allows messages to be tailored to the needs of different consumers and cultural contexts.

2. Public Service Announcement as a Complex Sign

PSA is a powerful instrument for reassessing social values and altering recipients' behaviour in socially significant situations. In the era of grave global challenges and social problems, it serves as a guideline for selecting optimal solutions. Digital technologies that penetrate the advertising discourse, provide innovative opportunities for PSA to attract a wider target audience and increase the effectiveness of message transmission.

PSA (in the USA, also – public service advertisement, in the UK – public information film (PIF), in Hong Kong - announcement in the public interest (API)) stands out among advertising discourse genres due to its potential to alter behavioral stereotypes and draw attention to current social issues. The most prominent examples of texts belonging to this genre include anti-drug campaigns, traffic enforcement, promotion of healthy lifestyles, and environmental protection, among others.

The development of PSA in the English-speaking world began at the end of the 19th century in the context of the protection of the Niagara Botanical Garden, which, according to 1894 data, contained more than 900 species of plants and many rare and endangered animals (Environmental Protection at Niagara Parks). Another vivid example of PSA was the call of the American Civil Association (1904) to protect Niagara Falls from the negative environmental impacts of the activities of certain energy companies. Subsequently, during World War I, the Social Revolution in the United States led to the condemnation of child labor and strengthened the patriotic feelings of citizens through such campaigns The War Savings Stamps, The Red Cross campaign and The Selective Service campaign (Goodwill 2022).

In the flow of history, PSA has undergone significant modifications, and the scope of its application has expanded. Currently, PSA has become the object of interdisciplinary research for sociologists, political scientists, psychologists, historians, linguists, and other.

According to the Cambridge Dictionary, PSA is an announcement made on TV, the radio, or the Internet, in order to give the public an important

message, for example about a health issue (Cambridge Dictionary: n.p.). PSAs are non-commercial messages aimed at raising awareness and knowledge, influencing attitudes, and/or inducing or molding certain behaviors, using mass media platforms (Bator & Cialdini 2000: 527; Martiniuk et al. 2010) "While PSAs are a type of advertising, they differ from regular advertising as they are intended to persuade consumers to change attitudes and/or perform behaviours that are beneficial to them and society as a whole, whereas advertisements are designed to get consumers to purchase a product." (Sivakumaran 2023). According to the Law of Ukraine "On Advertising", PSA refers to any information of any kind that is disseminated in any form and aimed at achieving socially beneficial objectives, promoting universal human values, and whose dissemination is not intended to make a profit (Law of Ukraine). Oksana Buhaiova views PSA as a crucial instrument for ensuring the political, economic, moral, and psychological stability of society (Buhaiova 2019: 33). PSA is a type of non-profit advertising aimed at changing patterns of social behavior and bringing attention to social problems.

From the perspective of communication theory, PSA is a form of mass communication, in which expressive-suggestive texts are created and disseminated, in order to incentivize recipients to make appropriate socially significant choices and actions. In this paper PSA is viewed as a coherent multimodal text represented by a unity of signs of different types that convey socially significant messages aimed at altering the social consciousness and behavior patterns of society members to promote their well-being.

Multimodality has become a fundamental feature of the contemporary communication space. In the wake of a digital era, the production of textual meaning has increasingly become a consciously semiotic affair. Multimodal texts refer to communication which involves multiple forms of expression or modes, such as natural language, images, sounds and others. Each mode possesses its own semiotic resources, thus multimodal texts present a combination of signs that, on the one hand, belong to different types, and on the other hand, – to different sign systems

The text of PSA becomes a complex sign in the space of culture, and the selection and combination of different types of signs in PSA is purposeful and aims to provide a specific interpretation of their complex combination. By virtue of its persuasive nature PSA possesses intentionality that is "held by cross-cutting intentions" (Arhypova 2002: 13). Umberto Eco emphasizes that signs "serve to communicate different things according to the circumstances and properties highlighted" is notable (Eco 2014: 191). For PSA to be successful, it is of paramount importance that it makes sense to

its intended audience. As a complex sign involved in semiosis, it possesses code, informational and cultural dimensions.

The code dimension focuses on the nature and systematic organization of the means of representation. Primarily the interpreter determines the nature of signs and their belonging to the particular sign system. The informational dimension relates to the relationship between the sign and the conceptual interpretant. The notion of a code is inseparable from the information that can be derived from a range of stimuli and phenomena. Not all of these are intended to convey a message but can be informative with the appropriate interpretation. The cultural dimension of semiosis provides the evaluative interpretation of signs predetermined by the cultural space of the interpreter. This approach offers a comprehensive framework for studying the semiotic processes within multimodal texts (Andreichuk 2021: 147–149).

3. Studies of Digital Metaphors in PSAs

3.1. Case Study 1: Icons

In order to illustrate the combination and mutual complementation of signs belonging to sign systems of different types, let us consider an example of PSA aimed at preserving wildlife (Figure 1) (the total corpus of research material is 40 units):

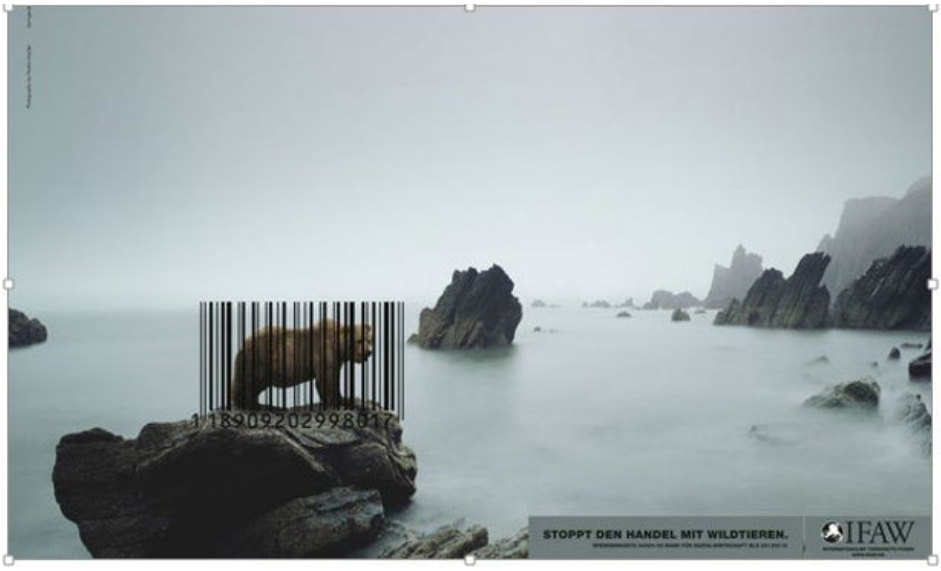

Figure 1: An example of a PSA from the advertising agency Springer & Jacoby Werbung (Public service advertisements about… 2014)

PSA depicted in Figure 1 encompasses natural language signs, namely: a) "Stopp den Handel mit Wildtieren" (Stop the Wildlife Trade), a call to action to halt the wildlife trade; and b) IFAW (International Fund for Animal Welfare), one of the largest animal welfare organizations in the world. Besides that there are two non-verbal (visual) signs: a) a barcoded image of a bear, which serves as a symbolic sign of wildlife, emphasizing the threat of its extermination; and b) the misty and serene landscape as the natural habitat in the background, evoking the pristine environments that are being disrupted and emphasizing the importance of animals being in the natural environment.

The barcode image is a digital metaphor represented by an iconic sign and requires a two-level interpretation. In fact, here we encounter double metaphorization, as the barcode: 1) is associated with the bars of the cages in which captive animals are kept (Metaphor A); 2) represents a method of recording data (product identifier) which is convenient for reading by various devices, thus it is associated with trade (Metaphor B). Although double metaphorization is not typical of digital metaphors used in PSA, it is an example of how different semiotic systems can interact to create a message. In the example analyzed, verbal elements serve as signs indicating the problem and the organization (company) working to solve it, while non-verbal elements complement this information, creating a visual context and strengthening the emotional connection with the audience.

3.2. Case Study 2: Indexes

Figure 2: An example of a PSA from Cramer-Krasselt, Milwaukee, the USA (40 strongest social posters…2015)

PSA shown in Figure 2 is another multimodal text. Verbal signs are the following:

a) "46 days in hospital bed." The inscription suggests a serious consequence of an accident, indicating that an individual can spend 46 days in the hospital if he has an accident;

b) "speed limit 25." It highlights the speed limit in a specific area, and the number 25 signifies a residential or school area where children or pedestrians may be present, further emphasizing caution;

c) "slower is better", which implies that driving slower is safer and can prevent accidents;

d) "Elm Grove Police," which is the name of the police department, suggesting they are involved in a campaign to promote road safety.

The non-verbal (visual) elements include the following:

a) the digital display of "46" on a radar speed sign likely reflects the actual speed of an approaching vehicle, providing immediate feedback to drivers;

b) a moving car, the blurred image of which reinforces the context of driving and speed;

c) the roadside, where the sign is placed, directly in the line of sight of passing drivers.

"46" on a radar speed is interpreted as a digital metaphor represented by an indexical sign. It suggests a direct consequence of speeding, namely that the higher the speed shown on the display, the higher the potential number of days spent in the hospital bed, whereas the latter is not shown directly.

This PSA employs a sophisticated mix of verbal and non-verbal signs to create a clear and impactful message to encourage drivers to adhere to speed limits and drive carefully in order to avoid accidents and the severe consequences that can come with them.

3.3. Case Study 3: Symbols

Figure 3 depicts a PSA that also incorporates both verbal and non-verbal elements. The verbal elements are the following ones: a) the note "A big part of the story is lost when it becomes a movie", which conveys that significant portions of the narrative, character development, and thematic depth that are lost in the transition from book to movie and b) Sebo Museu Do Livro, the book museum in San Paolo, Brazil.

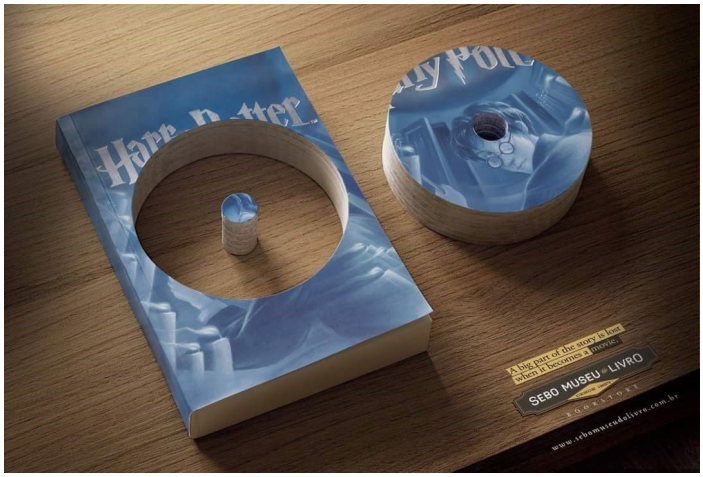

Figure 3: An example of a PSA from the Advertising Agency RockerHeads, São Paulo, Brazil (Sebo Museu do Livro)

The non-verbal (visual) elements include the following: a) a "Harry Potter" book with a large circular hole, representing the missing parts of the story that are often left out in movies; and b) the removed pages stacked next to the book resembling a DVD.

The book and disc convey the symbolic metaphorization and the symbolic critique of movie adaptations, all of which work together to highlight the value of reading books. This semiotic approach aids the viewer in comprehending and empathizing the significance of what is lost when a story is transformed from a literary work to a film.

Conclusion

The use of metaphors in public service advertising communication is shown to achieve pragmatic goals and ensure a predictable impact on the audience. Despite being a relatively new concept in metaphorical communication, digital metaphors align with Aristotle's belief that metaphor brings a sense of freshness. New technologies profoundly impact our understanding of the world, refreshing fundamental concepts. Digital artifacts serve as representations of digital reality objects and, similar to real objects, can be incorporated into metaphorization processes.

Digital metaphors are becoming increasingly popular in various genres, particularly in advertising, as they interpret the new through the known due to their similarity. In PSAs, digital metaphors can be represented by different types of signs, including non-verbal ones. Digital metaphors use the unique and functional capabilities of digital technologies to convey di-

verse aspects of physical or virtual reality by utilizing the language of these technologies. Thus, the successful interpretation of PSAs depends on the skillful manipulation of semiotic resources, particularly through the use of rhetorical means, among which the leading place is occupied by metaphor. To transmit messages creatively and effectively, it is beneficial to intensify work with associations by similarity, thereby producing signs rich in information and analogies.

Metaphors, including digital, go beyond the boundaries of conventional categories. The different types of signs singled out by Peirce, can convey metaphoric meaning, evoke associations, and foster interpretation of multimodal texts content. In PSAs, icons evoke perceptual similarities with their referents, thereby creating immediate and intuitive associations. Such metaphors rely on visual resemblance, structural similarity, or perceptual correspondence to convey meaning and foster emotive engagement. Indexes establish direct relations between signifiers and referents, conveying concrete associations. Indexes with metaphoric transference in PSAs establish explicit or implicit relations and create connections through contextual cues and associative links. Symbols acquire meaning through convention, representing abstract concepts, cultural meanings, or conceptual associations. Symbols with metaphoric transference in PSAs rely on shared cultural codes to convey complex ideas. Thus, metaphors enhance the semiotics of digital media, encouraging creative expression, symbolic innovation, and cultural resonance in contemporary communication. The analysis of digital reality conceptualized through metaphors in PSAs illustrates the potential of a semiotic perspective.

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ENHANCING CITY IDENTITY THROUGH DIGITAL METAPHORS

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Abstract

City branding is a discipline focused on unveiling the unique character of cities and enhancing their visibility, identity, and cultural impact. In recent years, cities have been exploring new methods to promote themselves and attract more visitors. This has led stakeholders and those involved in city branding to find new pathways to create "a new identifiable image" of the city (Riza et al. 2012), making it an attractive destination (Kotler & Gertner 2002). With the rise of digital technologies and globalization, the possibilities for city branding have significantly increased. In the digital era, many cities that pivoted from traditional models of branding have succeeded in renewing their identity using digital media and the incorporation of digital metaphors in their branding campaigns. As a result, many cities have managed to rebrand and refashion their identity. This paper aims to explore how cities are represented in digital media and which digital met-

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aphors are used to attract a younger, more technologically savvy audience. Through a multimodal framework, I will analyze the recent branding campaign of the city of Thessaloniki to identify how digital metaphors are used and their impact on younger audiences.

Keywords: city identity, city branding, digital metaphors, city break, social media

Introduction

Since ancient times, travel has played an important role for communities and humans alike. It has enabled the discovery of new cultures and has acted as a bridge to meeting new people, thus broadening experiences. Nowadays, the need to explore has persisted, taking on different facets. One important aspect in today's era is that both cities and countries are striving to become more attractive and thus appeal to new audiences. In this respect, governance and stakeholders are engaged in increasing a city's popularity and visibility. Thus, the way in which cities are branded, becomes pivotal in attracting tourists of diverse ages and sociocultural backgrounds.

Although the question of what makes a brand has been a topic of debate, many researchers define it as having all or a combination of elements such as a name, design, and logo. Thus, the identity of the product can be deduced and differentiated from other competitive products (Kotler et al. 2015: 285, 298). Although the concept of a brand is commonly associated with business, both countries and cities can act as brands. Cities are trying to portray themselves professionally, similar to the way in which a company would, and become global players by investing more resources into consolidating their image (Taylor 2012). Nevertheless, the branding of cities takes a different approach depending on the target group, whether it be internal or external tourism. As Garrido, Estupiñán and Gómez (2016) note, "city branding seeks the recognition of different characteristics and virtues of a nation outside its borders, while internally it has a transversal approach against the scope of the image of its different regions, cities and places" (cited in Bautista 2022: 15). In the last decade, there has been an increase in the number of cities promoting their image via social media platforms such as Facebook, Tik Tok, Instagram and YouTube. The use of such sites and applications allows cities to reach new and wider audiences while also keeping up with the latest digital marketing trends.

City Branding and Identity

City branding is intricately linked to place branding. One of the first to frame a definition of place branding was Anholt. Anholt (2003) claims that when a branding strategy or any marketing method is implemented in a place (regardless of its size: city, region, country, town) in order to promote greater social, political, and economic development, then it is referred to as place branding. There are three important components in the marketing process of a destination: what a tourist can visit and see (e.g. historical sites), the activities or festivities in which they can partake, and finally, the experiences they can gain, such as attending a local sporting event or shopping for traditional products (Köker et al. 2013: 55). When branding a place, three types of branding are frequently used, as noted by Kavaratzis and Asworth (2006: 190–191). The first type is geographical naming of the place, the second is product-place cooperation and the third is ground management. Place branding focuses on the reputation and image of a location and how these elements can be improved, in order to increase visibility and create a competitive identity by promoting the unique characteristics of each place. Competition in city branding is steadily growing due to economic constraints (Govers & Go 2009). Other than the commonly used term "place branding" the term "destination marketing" is key when promoting a place. Destination marketing ultimately seeks to make a destination attractive to potential visitors and increase demand. It also has the added benefit of boosting the economy and increasing investments.[1] Cities similarly employ specific promotional strategies to showcase not only their cultural heritage but also their natural beauty, activities, and experiences in which perspective visitors can partake. In fact, having geographical and cultural features in addition to hosting various events can positively affect the brand image of the city way (Kotler & Gertner 2002).

City Branding on Social Media

In recent years, cities have sought to attract different types of consumers and tourists, taking to more modern ways of rebranding and refashioning their identity through branding campaigns and promotional videos. Information technology has become a key instrument for local tourism organizations to promote their city or town. Local authorities make use of digital technologies to promote and rebrand a city, thus attracting younger audiences. The application of targeted communication through digital media contributes to creating a city's brand values as a tourism destination

[1] See: https://www.revfine.com/destination-marketing/ (accessed 24 May 2024).

by cultivating awareness and credibility (Stojanovic et al. 2018). Furthermore, websites provide a platform for a city to create a visualized identity. In this digital space, local tourist organizations can promote many aspects of a city such as its history and culture, the local food, and any upcoming art exhibitions, festivities, or local events. Additionally, any environmental sustainability practices a city follows can be advertised easily to a more diverse audience. Similarly, social media channels are becoming an important and popular means for municipal managers to broadcast information and engage the public (Bennett & Manoharan 2017). Given the participatory nature and accessibility of content available on social media, an increasing number of stakeholders and local municipalities are now using these platforms to shape a more technologically savvy image of their city and attract younger visitors. The more cities adopt specific branding techniques to position themselves nationally and internationally (Lucarelli & Berg 2011), the more digital media is seen as instrumental to the improvement of public relations (Manoharan & Wu 2021) and the enhancement of tourism. As other researchers claim, social media channels are becoming an important and popular means for municipal managers to broadcast information and engage the public (Bennett & Manoharan 2017). It is not only what is communicated about a city that is important, but also the way in which the content is conveyed. The use of high-resolution and dynamic images, exciting video clips, appropriate typeface, and coloured, fast-paced subtitles are some of the features of social media that are implemented in city branding videos. *In the age of digital media convergence,*[2] *digital metaphors are becoming increasingly important in this respect.* Younger audiences are not only consumers of content but also producers and commenters. Through this engagement, the popularity of a video posted on social media can reach a large audience. The fact that city and place branding strategies have been radically transformed in past decades is also worth mentioning. Other than the use of posters, tourist offices, and commercial spots on TV, most campaigns nowadays profit from the advantages that social media and internet websites offer. In fact, Ortiz–Osprina (2019) says that YouTube is one of the fastest-growing platforms. Based on the data reported on datareportal.com, the global number of users on YouTube in April 2023 was 2.527 billion, with 2.077 billion of those users being above 18. Thus,

[2] We have moved from media convergence to digital media convergence due to the use of social media. Drula (2015: 134) describes media convergence as the unification of different technologies and different content types.

without doubt, YouTube provides an opportunity for all people wishing to market their products, places, or ideas.

Digital Metaphors: Cities Acting as Influencers

Cities, countries, and governments use social media as a way of connecting with their citizens. Due to the extended use of smartphones and social media applications, almost everyone, including today's youth, uses social media to communicate information and share opinions. However, it is young people in particular who use it to follow influencers who themselves use social media as part of their career (see Abidin 2017). Cities can also be considered influencers in the sense that they too use social media to reach these younger audiences. The advantage of the world-wide-web is that it stores information to be used by companies and cities which want to shape their campaign strategy and invent a campaign based on the identities and wants of their target group. Thus, cities which are not as popular as London, Paris, or Barcelona, can at least now frame a new digital identity to themselves appear more attractive than their competitors. One way of enhancing their digital identity is to promote cultural and artistic events via social media thus seeking to revitalize their sleepy downtowns (Banks 2022). But how can cities become influencers? Cities are using so-called aggressive strategies to beat the competition and to stand out. Promotional media included television in the 90s, whereas nowadays, the main medium for promotion is social media. Social media is an excellent way to promote various aspects of a city's identity ranging from history to tourist attractions to festivities. We can understand how cities act as influencers by drawing on diverse definitions of this term. As the Cambridge Dictionary notes, an influencer is "someone who affects or changes the way that other people behave" and "a person who is paid by a company to show and describe its products and services on social media, encouraging other people to buy them".[3] As Banks argues, cities like Austin (Young 2019a, 2019b) which made it a primary goal to "engage new audiences for Austin arts & culture" accomplished this goal in part through "utiliz[ing] public relations/publicity to inform audiences of existing assets" (Public City 2015). The skill sets needed to be an influencer on any number of social media platforms are eminently transportable to this sort of work. Indeed, in the last few years, there has been even more focus within cultural planning on concepts like

[3] See: https://dictionary.cambridge.org/dictionary/english/influencer (accessed 24 May 2024).

reputation management (Bell 2016), thus trying to apply these concepts in the administration of neighborhood and city brands.

This paper seeks to present how cities are promoted on social media, drawing on concepts and graphics inherent in the work of influencers. Thessaloniki is presented on social media, and more specifically on the channel entitled Thessaloniki Travel, in the same way an influencer would promote their content. Various aspects of the city are promoted, with the language and graphics used making the content more accessible and interactive with the viewers, giving it a fresher look. Thus, the way the city is promoted becomes inherently linked to its identity. In my analysis, it will be delved into how emphasis is now given to the activities one can do, and the modern cultural and culinary aspects of the city rather than solely on the historical attractions.

Methodology

This paper explores how cities are alternatively promoted via social media, and more specifically on YouTube. It analyzes the recent campaign of Thessaloniki, prepared by its Tourism Organization Board entitled *City Break off the beaten track*. Other recent promotional videos of the city will also be a topic touched upon.

Through a multimodal framework, the recent branding campaign of the city of Thessaloniki is described in view of identifying how the city's identity is portrayed and which aspects of the city are being promoted. A multimodal framework was used in order to analyze the cultural values that are being promoted in the campaign and to acknowledge how the use of recent cinematic language was valuable in attracting a younger audience that was more in tune with the language of social media and recent digital marketing strategies.

City break off the beaten track

The rise of Airbnb and the expansion of low-cost airlines have given rise to a new kind of tourism known as the city break. But what exactly are city breaks, who are they intended for, and what is their significance? City breaks have become popular due to the affordability of low-cost airline fares and the growth of Airbnb. They cater to tourists' desire to explore a city over a short period. Hence, they can be a unique travel experience for each traveller. Such trips are mainly a European phenomenon and can be considered as part of urban tourism (Charterina & Aparicio 2015). Each city offers distinct attractions and promotes various forms of tourism such

as "cultural tourism, business travel, entertainment tourism, hobby tourism (including passive sports or festival tourism), post-industrial tourism, religious tourism, and sightseeing" (Balinska 2020: 86). These types of tourism are essential for attracting tourists. As noted by Kruczek and Zmyślony (2010), "[u]nlike peripheral area, cities are destinations for short trips" (Balinska 2020: 86). The researchers note that city break tourists usually visit both historical sites and new, less mainstream attractions that do not fall into what would typically be considered popular city attractions. As noted, Thessaloniki's Tourism Organization has recently been promoting the concept of short breaks, meaning a maximum of three nights away, as a way for people to get out of their routine and venture somewhere either domestically or foreign. Trew and Cockerell (2002: 86) note that this term refers to a trip to a city with no overnight stay at any other destination.

The recent campaign created by Thessaloniki's Tourism Organization was named *City break off the beaten track*. Before moving on to the analysis of the two spots that were part of this campaign, I would like to mention some specific information concerning the role of this non-profit organization. The organization decided on the key objectives of the promotional strategy of the city aiming to make the city more popular and attractive to diverse audiences while also refashioning its digital identity. The website of Thessaloniki's Tourism Organization notes, among other objectives, that its aims are "[p]romoting and highlighting the strategic advantages of Thessaloniki as an important touristic, commercial, economic, cultural, religious and cruise destination as well as a MICE destination" and at "[s]upporting and coordinating various events that promote the tourism profile of the Region".[4]

The president of the organization is also the mayor of the city. He along with specialists who are part and members of the non-profit organization define and set the aims and the key objectives of the city's tourist campaigns. The organization aims to promote small events which will attract diverse audiences. Such events are the Thessaloniki food festival and Comic Con. The Thessaloniki food festival is a project started by the organization in order to attract tourists, stakeholders, and everybody who wants to experience the city's notable gastronomy. Comic Con is another annual event which attracts many tourists. As announced on their official website: "The first edition of "The Comic Con" took place from May 8 to 10, 2015 at Warehouse C of the ALTH. It was the first comic convention – in the true

[4] See: https://thessaloniki.travel/about-us/thessaloniki-tourism-organization-t-t-o/ (accessed 24 May 2024).

sense of the term – ever held in Greece. It was based on the authentic tradition of the large comic conventions abroad, such as San Diego or New York, escaping from the comic exhibitions or comic events already taking place in the country".[5] This year's 2024 event: "The Thessaloniki Comic Convention "The Comic Con" is said to be the leading event for the world of comics in Greece. Many people from all over have come to visit Thessaloniki just for this event in the last ten years and with the event growing, so too will the number of tourists coming for a city break. The event lasts a weekend and is a perfect opportunity for a fan of this event to combine a city break with meeting and interacting with well-known people in the comic industry. One of the main objectives of the recent campaign of the city of Thessaloniki is it trying to attract younger audiences via social media.

Analysis of the Material

From an analysis of the campaign, the dynamic use of both images and typeface can be observed. Both the videos which were analyzed are very short, being 0:59 and 0:53 minutes. The videos follow the trends of contemporary promotional videos with rapid movement of the camera and multiple frames. The first video entitled *Thessaloniki City break off the beaten track*[6] showcases the main cultural values of the city, namely adventure, tradition, and Hellenicity. Its cultural heritage and modern way of living as well as the holding of concerts are also being promoted. The juxtaposition between old and new is further heightened through the typeface used. One reminds us of the ancient Greek alphabet, clearly referring to ancient Greece, whereas the other, more modern typeface is characterized by its diagonal orientation. The past can be seen to coexist harmoniously with the present.

One feature of the city that is particularly underlined in the video is the fact that it belongs to the UNESCO Gastronomy Network. This is appealing information for a visitor coming to the city for 2-3 days. The video emotionally appeals to the prospective visitors by prompting them to take part in this adventure. The phrase "Are you ready?" in bold and capital typeface suggests both an invitation and a challenge to take part in the action. The second video entitled *Thessaloniki your Christmas City Break*[7]

[5] See: https://thecomiccon.gr/past_events/tcc1/ (accessed 19 May 2024).

[6] The video is available at: https://www.youtube.com/watch?v=NTdAk2kUcxA (accessed 24 May 2024).

[7] The video is available at: https://www.youtube.com/watch?v=H_OLiqaolx8 (accessed 24 May 2024).

promoted tradition through the use of the ship used in Greece as a Christmas tradition. A panoramic view of the city as if filmed by a drone is shown along with several glimpses of the city.

Another cultural value portrayed is the friendliness of the local citizens and its gastronomy. What is particularly important is the use of red subtitles which suggests the festive period of Christmas. The subtitles are like those that appear on Tik Tok but not on usual videos of YouTube in that they are shorter in length and appear and disappear more rapidly than normal subtitles. This method is clearly used to attract younger audiences familiar with the nature of videos on Tik Tok. The same strategy showcases the diverse aspects of the city and the opportunities it offers to new visitors. By also visiting the website of Thessaloniki Travel, we notice that the main slogan of the campaign is "Many stories, one heart". These stories represent both the past and the various attractions that the city offers.

Both videos particularly appeal to younger generations who are particularly acquainted with social media platforms, especially YouTube. The rapid and ongoing movement of the camera along with the 360-degree point of view provides a holistic view of the city, unveiling different angles and aspects of its identity. Such digital cinematography allows for a more participatory and captivating experience thus engaging viewers of the video and enticing them to visit the city. Both the cultural heritage and the modern way of living which the city offers are promoted in the videos, thus differentiating this campaign from previous ones that mainly focused on cultural heritage and ancient monuments. Both the cinematic experience and the content experience are aimed at attracting younger foreign tourists who are evidently acquainted with digital media and its mechanisms. To conclude, this recent campaign of the city is a digital rebrand of the city.

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DIGITAL REALITIES AND METAPHORICAL CONSTRUCTS: A MULTIMODAL SEMIOTIC AND INTERMEDIAL ANALYSIS OF *BLADE RUNNER 2049*

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Abstract

The concept of metaphor has long been explored in film in a variety of ways, from Eisenstein's experimentations to more contemporary examples. Contemporary theoreticians such as Forceville (2016) have enhanced the concept of metaphor, moving away from its purely linguistic quality and underlying its multimodal aspect. In this article, we will use Forceville's paradigm of multimodal metaphors as implemented in films. We will analyse *Blade Runner 2049* (Villeneuve 2017), focusing on its representation of digital reality through multimodal metaphors. The film, widely acclaimed for its philosophical depth (Shanahan et al. eds. 2020) and visual storytelling, is set in a dystopian future where human-like androids coexist with humans and serve as a means for exploring digital metaphors in a society dominated by artificial intelligence and augmented reality. We ex-

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amine the film's use of visual, auditory, and narrative elements, in order to construct a metaphorical framework that reflects contemporary digital concerns. Through an in-depth exploration of its visual, auditory, and narrative dimensions, this analysis uncovers a dense metaphorical structure within the film. This structure mirrors pressing societal concerns regarding the evolution and impact of digitalisation, augmented reality, and artificial intelligence, providing a critical lens on contemporary technological advancements. The study aims to enrich the discourse on digital metaphors in media, highlighting the evolving interplay between human experiences and technological advancements.

Keywords: multimodal metaphors, Forceville, film, intermediality, *Blade Runner 2049*

1. Introduction

In contemporary cinema, the metaphorical constructs have become a powerful tool, providing insights into contemporary technological and societal concerns. This article focuses on the multimodal and intermedial aspects of Denis Villeneuve's *Blade Runner 2049*, a film highly acclaimed by critics for its philosophical depth and visual storytelling. By employing Charles Forceville's theory of multimodal metaphors, the analysis focuses on how *Blade Runner 2049* represents digital realities, exploring their implications for human identity and the nature of existence in an era dominated by artificial intelligence and bioengineered beings. The study investigates the film's use of visual, auditory, gestural and narrative elements, in order to construct a metaphorical framework which reflects the film's themes related to artificiality, digitality and technological advancements. The aim is to enrich the discourse on metaphors in media, especially cinema. Furthermore, it reflects on the influence of digital media on film, emphasizing the transformation in storytelling and digital techniques, which supports the arrival of a post-cinema era as articulated by theorists like Lev Manovich. In this sense, *Blade Runner 2049* is more than a narrative of futuristic dystopia based on extensive metaphors. These metaphors construct a crucial discussion on the nature of reality and identity in the digital age and a commentary on the evolution of cinema.

2. Theoretical and Methodological Framework

Conceptual Metaphor Theory (CMT), developed by George Lakoff and Mark Johnson in their seminal work *Metaphors We Live By* (1980), changed our understanding of metaphors by proposing that they are not

merely linguistic expressions but fundamental to human thought and action. According to CMT, metaphors allow individuals to understand and experience one thing in terms of another. This cognitive process extends beyond language into various human cognition and perception modes.

Lakoff and Johnson argued that metaphors are pervasive in everyday life, not just in language but also in thought and action. They introduced the idea that the human conceptual system is fundamentally metaphorical, meaning that abstract concepts are often understood in terms of more concrete experiences.

Charles Forceville (2006, 2007, 2009, 2016) extended the principles of CMT to visual and multimodal metaphors, asserting that the mechanisms underlying metaphorical thought apply to multiple modes of communication, including visual images, sounds, and gestures. In his work, Forceville emphasizes the notion that metaphors in films and other media are not confined to verbal language. They can be expressed through visual and auditory elements that interact to create complex metaphorical meanings. In the context of film, multimodal metaphors involve the integration of various modalities to convey metaphorical meaning.

In discussing the terminology associated with metaphors, Forceville distinguishes between the "target" and "source" of a metaphor. The target is the phenomenon being described, while the source is the phenomenon to which the target is compared. For instance, in the metaphor "life is a journey," "life" is the target, and "journey" is the source. This distinction is crucial because it highlights the directional nature of metaphorical mapping, where features from the source domain are projected onto the target domain, in order to facilitate understanding. Forceville extends the discussion of metaphors to encompass visual and multimodal contexts, particularly film. He categorizes metaphors into several types: *Contextual Metaphors*, in which the context of the target suggests the source; *Hybrid Metaphors*, in which the target and source are physically merged into a single, often non-existent; gestalt and *Simile-Type* Metaphors., where the target and source are juxtaposed without manipulation. Forceville differentiates between creative (resemblance) metaphors, which establish novel comparisons between unrelated domains, and structural (primary) metaphors, based on systematic patterns of thought rooted in sensory and physical experiences. Structural metaphors, such as "time is space", are considered foundational to human cognition and are reflected in various cultural expressions.

Forceville also notes how a film's genre influences the interpretation and effectiveness of metaphors. For example, science fiction and fantasy genres, with their propensity for hybrid creatures and transformative visuals, are

particularly conducive to metaphorical construction. In contrast, genres such as documentaries might rely more on editing to create metaphorical meanings.

Kathrin Fahlenbrach's work, and more specifically her edited volume *Embodied Metaphors in Film, Television, and Video Games: Cognitive Approaches* (2016), examines how embodied metaphors function across various media forms. Her research complements Charles Forceville's framework by emphasizing the cognitive and emotional engagement these metaphors elicit from audiences.

Fahlenbrach argues that films utilize embodied metaphors to evoke visceral responses, making abstract concepts more tangible and emotionally resonant. This is achieved by leveraging the audience's sensory and emotional experiences which is particularly evident in films like *Blade Runner 2049*. The movie's use of embodied metaphors in its characters' physical and emotional experiences aims to elicit empathy and provoke reflection among viewers.

Additionally, Fahlenbrach discusses the concept of intermediality in film metaphors, where different media forms and sensory modalities intersect to create a unified metaphorical experience. This is particularly relevant in *Blade Runner 2049*, where integrating visual art, sound design, and narrative storytelling creates a complex, multimodal metaphorical world. This blending of modalities invites viewers to engage with the film on multiple levels, aligning well with Fahlenbrach's notions of embodied metaphors.

2.1. Cinema in the Post-media Era

Bazin in his critical essay, "Pour un cinéma impur: défense de l'adaptation", written in 1951 made a call for impurity in cinema. As Nagib and Jerslev expound on his idea of impurity: "impure" for Bazin seemed to mean […] accepting reality as it offers itself to the camera with all its contingent and apparently irrelevant bits, even if this reality is nothing but a book on which a film is based" (2014: xix–xx). In the post-media age, Bazin's notion of impurity is more pertinent than ever, with all the genres, media, and new technologies that heavily impact cinema. Nagib and Jerslev (2014: xviii) explain that Bazin's "call for hybridisation" is very relevant today due to "the spiralling mixture of media that pervades our virtual space". This mixture of media challenges our concept of cinema and pushes the audience to new experiences and cinematic spaces.

As Pethö (2012: 1) notes, since the centenary of cinema, there has been heated debate about the "imminent demise of the cinematic medium" and "the death of classical cinema". She claims that words such as "media con-

vergence" or "post-media aesthetics" have refashioned the "ecosystem" of media through various "processes of hybridisation and media convergence" (ibid.). Thus, media can no longer be considered "isolated monads" (Müller 2010: 18) but hybrid forms that englobe the qualities and materiality of diverse media and genres. Casetti refers to this process as "relocation" (2008: 27), meaning that the life of a medium continues in an altered form. He informs us that a new experience is regenerated elsewhere. In a similar way, Pethö expounds that in the post-media era, one cannot refer to the medium of cinema but should rather refer to "an all pervasive "cinematic experience" (2012: 3). These experiences take new forms and are screened in a multitude of spaces to provoke various emotions in the spectator. In this multitude of spaces and genres,[1] it is crucial to ask what happens to cinema and its analogue form as we have experienced it until now.

In his book, *The Language of New Media* (2001), Lev Manovich refers to the blurring of boundaries between media in the digital age. More prominently, he notes that cinema is no longer diverse from animation since, with digital technology, directors can change anything from cinematography to lighting and thus create more dramatic or atmospheric results. He explains that cinema "is no longer an indexical media technology, but, rather, a sub-genre of painting" (2001: 250). Manovich, in fact, compares the post-cinematic to the pre-cinematic era when films were hand-painted and hand-drawn (ibid.). In exactly the same way as artists painted specific sequences of film in the first years of cinema to create a different effect on the viewer, digital artists today paint specific sequences. In the post-cinema era, films can be shot on location, and then some sequences can be digitally painted by digital artists to create a more dramatic or atmospheric effect.

Digital media have heavily impacted on film by transforming not only the notion of storytelling but also the techniques used in filmmaking. We have thus, in Manovich's words (2016),moved towards a post-cinema era. He claims that most critics equate the advent of digital technologies to interactive cinema. Nevertheless, as he argues, although it is very exciting to suggest to the audience that they can actively participate in the making of the narrative and interact with characters, this is only one possibility of digital cinema. He describes that:

> The challenge which digital media poses to cinema extends far beyond the issue of narrative. Digital media redefines the very Identity of cinema […] what used to be cinema's defining characteristics have become just the de-

[1] Pethö (2012: 3) lists several post-media genres, among which are web video, 3D cinema, computer games that operate through the use of moving image narratives, DVDs and television, which is adapted "to all these new forms".

> fault options, with many others available. When one can "enter" a virtual three-dimensional space, viewing flat images projected on the screen is hardly the only option (Manovich 2016: 20).

3. *Blade Runner 2049* Analysis

Plot Synopsis

Blade Runner 2049, directed by Denis Villeneuve, is a sequel to Ridley Scott's 1982 classic film *Blade Runner*, based on the novel *Do Androids Dream of Electric Sheep?* by Philip K. Dick, published in 1968. Set thirty years after the original, the film focuses on themes of identity, technology, memory, surveillance and existence.

The film opens in a dystopian future where bioengineered humans known as replicants serve as slaves. The protagonist, Officer K (Ryan Gosling), is a new model replicant working as a blade runner for the LAPD. His job is to "retire" (namely to kill) old model replicants who have gone rogue. The story begins with K hunting down and retiring a replicant named Sapper Morton (Dave Bautista). During this mission, K discovers a box buried beneath a tree on Morton's farm. The box contains the remains of a female replicant who died during childbirth. This revelation is groundbreaking because replicants were not supposed to be capable of reproduction. They could only be created (and controlled) by humans. The remains are identified as Rachael[2], the replicant loved by Rick Deckard (Harrison Ford) from the original film.

Lt. Joshi (Robin Wright), K's superior, orders him to find and destroy the child, in order to prevent societal chaos. K's investigation leads him to a DNA record matching Rachael's child, leading him to an orphanage. At the orphanage, K finds a wooden toy horse with a date carved into it, which matches his memory of hiding the toy as a child. Believing he might be the child of Rachael and Deckard, K seeks out Dr. Ana Stelline (Carla Juri), a memory designer who creates memories implanted in replicants. Dr. Stelline confirms that the memory of the toy horse is real, intensifying K's belief that he might be the first replicant child born naturally.

Niander Wallace (Jared Leto), the head of the Wallace Corporation, which took over the Tyrell Corporation, is obsessed with discovering the

[2] In *Blade Runner 2049*, the character Rachael, originally played by Sean Young in the 1982 film *Blade Runner*, appears again. For the scenes in *Blade Runner 2049*, Sean Young's likeness was recreated using CGI technology, with actor Loren Peta serving as the body double for the physical performance. This combination of advanced digital techniques and physical acting allowed Rachael to be brought back to the screen in a way that closely resembled her original appearance.

secret to replicant reproduction, in order to expand his production. Wallace's enforcer, Luv (Sylvia Hoeks), is tasked with finding the child. Luv follows K's trail and kills Lt. Joshi to protect Wallace's interests.

K's A.I. companion, Joi (Ana de Armas), plays an important role in his journey. Joi is a digital construct who provides emotional support to K. She names him "Joe," reinforcing his sense of individuality. Joi's presence highlights the theme of artificial relationships and the search for meaning in a digital age.

K's investigation leads him to Las Vegas, where Rick Deckard is isolated. Deckard reveals that he and Rachael had a child together whom he hid to protect from those who would exploit her. Luv captures Deckard and destroys Joi's emanator, effectively killing her. K, left for dead, is rescued by the replicant resistance led by Freysa (Hiam Abbass). Freysa reveals that K is not Rachael's child but was given her memory to help hide the real child, Dr. Ana Stelline. Determined to protect Deckard and give him a chance to meet his daughter, K intercepts Luv's convoy transporting Deckard to Wallace's headquarters. In a brutal fight, K kills Luv and rescues Deckard. K takes Deckard to Dr. Stelline's laboratory, where Deckard meets his daughter for the first time. The film ends with K lying on the laboratory steps, injured and gazing up at the snow, reflecting on his journey and newfound understanding of his Identity.

4. Film Metaphors

Discussing metaphors in *Blade Runner 2049* is essential, since the film is metaphorical in its totality. This aligns with Forceville's words on how a film's genre influences the interpretation and effectiveness of metaphors. One pervasive metaphor in the film is urban decay seen as societal collapse. The dystopian cityscapes of Los Angeles are depicted as bleak, rain-soaked, and shrouded in perpetual darkness, symbolizing the erosion of societal structures and human values. The omnipresent pollution, towering monolithic structures, and dilapidated buildings serve as visual metaphors for a world where technological advancement has come at the cost of environmental degradation and social disintegration. This setting reflects the consequences of unchecked industrialization and the dehumanizing effects of a society which prioritizes technological progress over ecological and communal well-being.

In contrast, the scenes set in the ruins of Las Vegas present a different environment. Once a vibrant city known for its entertainment and excess, Las Vegas is now a barren, irradiated wasteland buried under a thick layer of orange dust. This desolate environment symbolizes the destructive con-

sequences of humanity's actions and the ultimate collapse of a society built on unsustainable practices. The abandoned casinos and statues of forgotten celebrities stand as eerie monuments to a bygone era, serving as a stark reminder of the fragility of human achievements in the face of ecological disaster.

The omnipresent, harsh artificial lighting in the urban environments contrasts sharply with the natural light, which is often dim and obscured. This lighting metaphorically represents the superficiality of technological advancements that promise enlightenment and progress but deliver a cold, unwelcoming reality. The artificial lights create an illusion of vibrancy and activity, yet they fail to illuminate the deeper truths and moral ambiguities faced by the characters. This metaphor is visually reinforced through the cinematography which uses stark contrasts between light and shadow to emphasize the duplicity of the world depicted in the film.

Another omnipresent metaphor in *Blade Runner 2049* is silence as isolation. The film often employs long stretches of ambient sound or complete silence, especially in scenes involving the protagonist, K. These moments of quietude express his isolation in a world teeming with artificial life yet devoid of genuine connections. The minimalist soundscape contrasts with the overwhelming sensory input of the city's advertisements and digital interfaces, highlighting the disconnection between K's internal world and the external chaos. This metaphor is in line with the film's theme of alienation in a hyper-digital age, where meaningful interactions are scarce, and individuals navigate an impersonal, automated environment.

Below we will analyze specific metaphors closely connected with the main themes of the film. It is interesting that the target of the metaphor in many cases is the same. It has many different metaphor sources due to the interconnection of the metaphors to express the film's themes. Moreover, as the film narrative evolves, the metaphor source changes.

Memory is (false) Identity

The metaphor of *Memory is Identity* signifies the replicants' quest for identity and self-understanding. In the film, implanted memories are used to discuss the impact of personal history on one's sense of self, charging these memories with emotional significance that surpasses their artificial origins. Richard Heersmink and Christopher Jude McCarroll (2020) discuss how shared memories play a crucial role in shaping personal identities and emotional connections, emphasising their role in self-perception (Heersmink & McCarroll 2020). Through K's journey, the film reveals how memories, whether real or implanted, play a crucial role in shaping identity

and emotional connections. The audience is provoked to reconsider the essence of what makes someone "human" in a world where the lines between the "real" and the constructed, and the physical and the artificial are increasingly blurred. The scene where K discovers the wooden horse at the orphanage blurs the line between implanted and real memories, challenging K's understanding of his past. This moment is pivotal for K's emotional journey, confirming the reality of his memory while casting doubt on his identity. The orphanage symbolizes abandonment and lost potential, mirroring K's internal struggle with his perceived lack of identity and belonging (Heersmink & McCarroll 2020) The memory suggests that he might be the offspring of Rachael (Sean Young) and Deckard (Harrison Ford), positioning him as potentially the first naturally-born replicant. This crucial revelation directly ties K's sense of self to this memory, suggesting a unique identity among replicants. The wooden horse itself, symbolizing innocence and childhood, along with the curved date of birth at its bottom, becomes a tangible link to a seemingly real past, challenging the boundaries of his implanted identity (Savulescu 2017a).

Moreover, K's visits Dr. Ana Stelline (Carla Juri), a memory designer, and she confirms the authenticity of K's childhood memory. Her emotional reaction reinforces the memory's genuine impact. This scene highlights the importance of memory authenticity in establishing identity, suggesting that memories, even when implanted, can hold emotional truths. Dr. Stelline's tears while viewing the memory emphasise its emotional depth, affecting not only K but also others who encounter it. This shared emotional resonance reinforces the idea that memories contribute significantly to the construction of a shared identity (Clowes 2020).

Joi (Ana de Armas), K's holographic A.I. companion, plays a crucial role in validating his memories and sense of Identity. Her constant reassurances of K's importance and her act of naming him "Joe" (*name as Identity*) provide him with a sense of individuality, reinforcing his belief in the significance of his memories. This dynamic highlights the need for external validation in the construction of self. Joi's genuine-seeming emotions and shared memories with K underline the paradox of seeking authenticity through artificial others (Smart 2020). Joi's interactions with K complicate his understanding of his own emotions and identity, highlighting the complex interplay between artificial and authentic feelings. Their relationship brings into question the nature of memory and love, suggesting that memories, regardless of their origin, can forge real emotional bonds.

The revelation that Dr. Ana Stelline is the true source of the memory, not K, shatters his belief in his uniqueness among replicants, but also redi-

rects his understanding of self-identity. This moment underlines the shared nature of human and replicant experiences, indicating that memories, even when transferred, can create a sense of identity. K's subsequent identity crisis and acceptance of his role in the larger narrative of replicant freedom reflect a redefinition of self (Heersmink & McCarroll 2020). "It becomes evident that K's incremental embrace of his own agency becomes its central and most- important motif." (Shanahan 2020: 22). Despite the revelation, K's journey illustrates emotional resilience and growth. His acceptance of his true nature, as well as his continued pursuit of meaning, demonstrate a deeper understanding of identity beyond implanted memories (Savulescu 2017; Jangles 2023).

Artificial Intelligence as Emotional Being

The metaphor *Artificial Intelligence is Emotional being* is mainly embodied in the character Joi, K's holographic A.I. companion. This metaphor pinpoints the blurred lines between programmed responses and genuine feelings, challenging the audience to consider the authenticity of emotions as expressed by A.I. The relationship between K and Joi invites viewers to question the meaning for an artificial being to possess or express genuine emotions. As Fiona Woolard notes:

> We can see her as something that was originally a mere product, but who later developed a genuine personality and genuine emotions. This would fit with my contention that it is not how we start out that matters, but how we end up. (Woolard 2020: 58)

One of the most significant scenes which illustrate this metaphor occurs when Joi interacts with K in their apartment. Joi's ability to adapt her behaviour and express affection mirrors human emotional dynamics. Her expressions of love and concern for K seem genuine, suggesting that A.I. can mimic the depth of human relationships. This scene challenges the viewer to question whether Joi's programmed emotions can be considered authentic. The metaphor here underscores the film's exploration of whether A.I. can truly replicate human emotions and have feelings of its own, as well as the implications of forming emotional bonds with artificial beings.

K's ability to "pause" Joi, even in the middle of a kiss, emphasizes the control which humans, and by extension replicants, can exercise over A.I. This highlights the inherent power dynamics in their interactions. Despite this control, Joi's interactions with K suggest a level of emotional depth that challenges the boundaries between programmed responses and genuine feelings.

The metaphor is further expressed in the scene where Joi convinces K to take her emanator, a portable projection device, allowing her to accompany him outside the confines of their apartment. This act of leaving the safety of her fixed projection point symbolizes Joi's willingness to share K's experiences and risks. It enhances the questions concerning her genuine feelings, and raises questions about the nature of love and care in a digital age. It asks whether artificial constructs can genuinely have complex emotional lives as humans. Later in the film, when Luv destroys her emanator, Joi's last words to K are filled with authentic concern and affection. Her final moments vividly express the emotional bond they have developed despite her artificial, intangible nature. K feels devastated. Overall, the scene discusses the transience of digital relationships and the impact of losing what feels like a real emotional connection.

The sex scene between Joi, K, and the surrogate Mariette, further complicates this metaphor. Joi's desire to provide K with a physical experience of intimacy leads to the merging of her holographic form with Mariette's physical body. The scene begins with Joi's holographic form shimmering and aligning with Mariette's body, creating an uncanny blend of the two women. As Joi's image flickers and adjusts to match Mariette's movements, the synchronization process highlights the ethereal and intangible nature of Joi. The visual effect is mesmerizing and disorienting, as the two sets of eyes, lips, and hands occasionally misalign, reminding the audience of the artificial nature of Joi's existence.

This fusion of digital and physical forms raises questions about authenticity and connection in an age where digital and physical realities increasingly overlap. The scene's choreography and special effects emphasize the fragility and impermanence of Joi's holographic form, contrasting it with the solidity of Mariette's body. This visual merging reinforces the complexity and ambiguity of emotions in the digital age, suggesting that genuine emotional connections can emerge even from artificial constructs.

The delicate interplay of light and shadow on Joi's holographic projection against Mariette's physicality creates a striking visual metaphor for the blurred boundaries between the digital and the real, ultimately questioning the nature of intimacy and connection in a technologically advanced world.

In other words, Joi's interactions with K throughout the film consistently reinforce the metaphor of Artificial Intelligence as Emotional being. Her ability to display a range of emotions from joy and curiosity, to fear and love, invites the audience to reconsider the boundaries between authentic and artificial feelings.

Artificial beings are Divine Creations

This metaphor focuses on the concept of artificial life creation as an act of God-like power, critiquing the hubris and ethical implications of playing God with artificial life.

One of the most significant scenes illustrating this metaphor occurs when Wallace introduces a new replicant model. As the replicant is "born", Wallace delivers a monologue on the nature of creation and his desire to push the boundaries of what is possible. His words and actions suggest that he sees himself as a god-like figure, bestowing life upon his creations. On the visual level, the scene is clinical, with the new replicant emerging from a synthetic womb-like structure. This imagery reinforces the metaphor of divine creation, highlighting the parallels between Wallace's technological prowess and the act of divine creation in religious texts.

More specifically, the process of creating the replicant is depicted with a mix of reverence and cold efficiency. The scene opens with Wallace and his assistants in a pristine, almost sacred environment, stressing the reverence with which the creation act is treated. However, the efficiency and clinical nature of the process emphasize the dehumanizing aspect of treating creation as a mere technical achievement. The new replicant emerges from a synthetic womb filled with a gelatinous substance. This visual image evokes the natural birth process, where the womb and amniotic fluid symbolize protection and nurturing. However, the artificial nature of this womb and fluid brings out the replicants' manufactured origin, contrasting natural birth with synthetic creation. The gelatinous substance surrounding the replicant is a metaphor for (artificial) amniotic fluid, representing the nurturing environment required for life to begin. The fluid's artificiality highlights the replicants' constructed nature, differentiating them from naturally born humans. The gel symbolizes Wallace's control over the creation process, akin to a god moulding life from raw materials. This underscores the power dynamics between creator and creation, with Wallace manipulating the very environment from which new life emerges. As the replicant emerges from the gel, the water pouring over her can be seen as a ritualistic cleansing, signifying purification and the transition from the "womb" to the world. Water is traditionally a symbol of life and rebirth. In this context, it foregrounds the replicant's new beginning and the power Wallace holds to grant or deny this rebirth.

The newly-born replicant's position – naked, vulnerable, and covered in gel – mirrors the vulnerability of a newborn. This imagery evokes a sense of fragility and innocence, contrasting with Wallace's subsequent actions. Wallace's inspection of the replicant, followed by her casual disposal when

she does not meet his standards, illustrates the extent of his control over "life and death". He perceives himself as a divine creator. The replicant's fear, innocence and helplessness underscore the ethical implications of creating life with the power to destroy it so easily. The metaphor is further manifested through Wallace's obsession with creating replicants capable of reproduction. His ambition to make replicants that can procreate is driven by a desire to achieve a self-sustaining form of artificial life, mirroring the generative power attributed to divine beings.

Another key scene which expresses this metaphor is Wallace's conversation with Deckard. Wallace attempts to manipulate Deckard by offering him a new, perfect version of Rachael, complete with her original memories and appearance. This act of recreating Rachael evinces Wallace's belief in his god-like ability to control life and death. This scene's visual and auditory elements, with the eerily, almost accurate recreation of Rachael and Wallace's calm, persuasive tone, enhance the metaphor of divine creation.

The metaphor is also evident in Wallace's headquarters. The grand, temple-like architecture of his workspace, combined with the serene, almost ethereal lighting, creates an atmosphere which resembles a divine sanctuary. This setting reinforces Wallace's self-perception as a god-like figure, elevating his technological creations to the level of divine miracles. The visual grandeur and solemnity of his headquarters contrast sharply with the ethical questions and moral ambiguities surrounding his actions, depicting the tension between technological advancement and moral responsibility.

Replicants are (not) Human Surrogates

K, a replicant himself, is tasked with "retiring" older models of replicants. These scenes depict replicants as surrogates for human labour and roles, performing tasks deemed too dangerous or undesirable for humans. The visual elements, such as the replicants' realistic human appearance and their integration into society, stress how replicants are substitutes for real human beings. As notes, "while humans are not stronger, more intelligent, or cybernetically enhanced, replicants are nothing more than the slaves of the galaxy, seemingly having few to no rights" (Elyamany 2021: 6).

The auditory elements, including the cold, "clinical" language used to describe their functions and termination, further reinforce their role as mere stand-ins for humans (Shanahan & Smart 2020). Humans refer to the replicants as "skins", a semblance of human beings that do not have a soul. They are not born, they are constructed, and thus, they can do everything the humans want of them.

K visits Sapper Morton's farm, an older model replicant who lives a quiet, reclusive life as a protein farmer. The setting – a barren, desolate farm – indicates the replicants' isolation and the minimal acknowledgement they receive for their contributions. In this scene, another metaphor occurs as K finds Rachel's bones under a tree. The dead tree where K finds the buried remains of Rachael is a visual metaphor for life, memory, and growth. Trees traditionally symbolize life, continuity, and the passage of time. In this context, the barren tree, linked with the discovery of Rachael's remains, epitomizes the theme of life and death. The tree also symbolizes the roots of memory and identity that are deeply embedded in the past. K's discovery under the tree represents uncovering hidden truths and memories that shape one's identity and sense of self, which contrasts with his role as a mere human surrogate.

This metaphor is also evident in the character of Luv, Wallace's replicant enforcer. Luv's role as Wallace's surrogate in executing his will and maintaining order highlights the idea of bioengineered beings as extensions of the power and desires of their creators. Her actions, often violent and ruthless, reflect Wallace's ambitions and moral blindness. The visual elements of Luv's precise, calculated movements and her unwavering loyalty to Wallace put stress on her function as an instrument rather than an independent being.

The film's depiction of the replicant underground resistance further builds upon the metaphor. The resistance, composed of replicants seeking freedom and recognition, symbolises the surrogate life seeking its own identity and rights. The visual and auditory elements of their secret meetings and passionate speeches point to their desire to transcend their roles as surrogates and be acknowledged as sentient beings with their own purpose. This reversal of the "source" part of the metaphor implies the potential for bioengineered beings to evolve beyond their designed functions and seek self-determination.

Artificial Beings is Evolution

This is one of the most important metaphors in *Blade Runner 2049*, and is mainly embodied by the replicants' journey toward self-awareness and autonomy. This metaphor focuses on artificial beings not as human constructs but as entities capable of growth, adaptation, and self-improvement, reflecting broader themes of change, survival, and progress. For example, when K discovers the buried remains of Rachael, a replicant capable of giving birth, humans in power were shocked that replicants, originally designed as obedient servants, have the potential for biological reproduc-

tion – a fundamental aspect of evolution. The scene contains metaphorical visual and auditory elements which underline this groundbreaking revelation. The desolate, barren landscape where the remains are found is a metaphor for the dormant potential of replicants, waiting to be unearthed and recognized.

The metaphor is further embodied by the character of Niander Wallace, who seeks to unlock the secret of replicant reproduction. Wallace views this capability as the next step in the evolution of bioengineered beings, allowing replicants to proliferate independently and ensuring humanity's expansion across the stars. What Wallace wants is more instruments, and more replicants to be controlled, rather than the replicants' evolution towards an autonomous existence.

Additionally, the replicant resistance movement is another element that verifies this metaphor. Led by individuals like Freysa, a former combat medic replicant, the movement embodies the drive for freedom and self-determination. These replicants are not content with their prescribed roles and seek control over their identities and futures. The visual representation of the resistance, with its hidden networks and undercover meetings, is a metaphor for the underground nature of evolutionary change, often occurring away from the eyes of those in power. The auditory elements, such as the whispered conversations and the sounds of preparation for rebellion, enhance the sense of an impending shift in the replicants' status and capabilities.

K's journey is a major expression of the metaphor. Throughout the film, K grapples with his identity and purpose, evolving from a compliant blade runner to a self-aware individual questioning his existence. His interactions with Joi, another form of Artificial being, and his discoveries about his own past drive this evolution. K's transformation is visually marked by changes in his demeanour and actions, reflecting his growing self-awareness and autonomy. The auditory elements, such as his evolving dialogue and the changing tone of his voice, mirror his internal journey toward self-discovery and evolution. The metaphor of *artificial beings is evolution* is also evident in the replicants' ability to form emotional bonds and relationships, challenging the notion that they are mere "skins". Joi evolves from a basic program into an entity capable of complex emotions and interactions. In general, *Blade Runner 2049* is full of scenes that follow the evolution of artificial beings' journeys, constructing a multimodal metaphor.

Artificial Intelligence is Surveillance

The metaphor is evidenced by the ubiquitous presence of AI-driven monitoring systems throughout the film. This metaphor focuses on the

pervasive and intrusive nature of surveillance in a technologically advanced society, foregrounding themes of control, privacy, and autonomy. For example, during the film, K undergoes "the baseline test" in many instances. The test, designed to ensure that K remains emotionally stable and compliant, uses advanced AI algorithms, in order to analyze his responses to various stimuli. Visually, the stark, clinical setting of the test room, combined with the dispassionate voice of the AI conducting the test that continuously repeats the same phrase: "cells, within cells…" constructs a metaphor for the dehumanizing nature of surveillance. The repeated phrases and the mechanical, impersonal delivery highlight the oppressive control exerted over K's life, accenting the metaphor of A.I. as a tool of surveillance and control. As Clowes notes:

> The test appears to be designed to check for signs of cognitive or emotional (ab)normality. As with most engineered artefacts, K is designed to fulfil a function, and the baseline test ensures that he is operating within the limits of his design specification. Given the overriding concern with issues of control and obedience in BR2049 – replicants should obey their human masters – it is likely that the baseline test functions as a guarantee: it ensures that blade runners are operating in the manner of a "good angel" (to quote Wallace). As we learn from the movie, a failure to meet the demands of the baseline test is sufficiently serious to warrant a blade runner's (involuntary) "retirement." (Clowes 2020: 115)

Moreover, K's movements are constantly monitored by his superiors at the LAPD. The advanced AI systems track his location, activities, and even his emotional state, leaving him with little to no privacy. On the visual level, the use of screens displaying K's actions and the omnipresent surveillance cameras create a sense of being constantly watched. This surveillance extends to other replicants and humans in the film and illustrates the broader societal implications of AI-driven monitoring. The auditory elements, such as the background hum of machinery and the occasional beeps of tracking devices, enhance the atmosphere of constant oversight. Wallace also uses advanced AI technology to monitor and control his replicant creations, treating them as tools to be observed and manipulated. His surveillance extends to tracking and eliminating any replicants who deviate from their programmed behaviour. Wallace's headquarters, filled with sophisticated monitoring equipment and surveillance drones, reinforce the metaphor of AI as an all-seeing, omnipotent presence.

In essence, *Artificial Intelligence is Surveillance* is an omnipresent metaphor in the film. For example, the A.I. advertisement systems bombard citizens with personalized messages. These AI-driven advertisements

track individuals' preferences and behaviours, creating a tailored and intrusive experience. The towering holographic ads dominate the cityscape and stress the pervasive nature of surveillance in every aspect of life. The auditory elements, such as the constant chatter of advertisements and the ambient noise of the bustling city, enhance the sense of being surrounded and monitored at all times.

"Humanity" is a Spectrum

Throughout the film, the varying degrees of human-like qualities in replicants, from their emotions to their physical capabilities, serve as metaphors for the spectrum of humanity that can exist. This diversity challenges the binary notion of human versus machine. It poses questions of what it means to be human through the evolving consciousness and autonomy of replicants and reflecting the idea that humanity is not a fixed state but a spectrum that includes digital beings (Savulescu 2017).

5. Conclusions

Blade Runner 2049 includes a multitude of complex and intertwined metaphors which deepen the narrative and themes of the film, exploring contemporary concerns about identity, technology, and the nature of humanity in the digital age. The metaphors focused on artificiality and find their best expression through the character of Rachael, originally played by Sean Young in the 1982 film. In *Blade Runner 2049*, Rachael is brought back to life using CGI technology, with Loren Peta serving as the body double. This blend of advanced digital techniques and physical acting emphasizes the theme of artificiality, highlighting the tension between real and replicated.

Rachael's character in the original *Blade Runner* was a replicant with a strong sense of identity. She and Deckard shared common memories and a life together, ultimately resulting in the birth of their child. This groundbreaking event marked Rachael as the first replicant capable of reproduction. In *Blade Runner 2049*, when Wallace presents Deckard with a recreated Rachael, complete with original memories and appearance, the moment is laden with emotional and philosophical significance. Despite the replica having the correct eye colour, Deckard's remark, "Her eyes were green", expresses his rejection of Wallace's attempt to manipulate him. This statement signifies more than just a factual error; it is Deckard's assertion that the essence of the original Rachael – her unique identity and the shared history they built together – cannot be replicated. This scene connects deeply with Lev Manovich's notion of the post-cinema era where everything is

constructed, and the boundaries between real and artificial are increasingly blurred. The recreated Rachael represents the epitome of this construct.

In essence, *Blade Runner 2049* constructs a metaphorical framework which discusses societal concerns regarding digitality, artificiality and technological advancements. It poses questions about identity and "humanity". Ultimately, the film invites the audience to reflect on the nature of existence, reality and authenticity in a world increasingly dominated by digital constructs, poignantly summarized in Deckard's words: "Her eyes were green."

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