

Unnaturally Human: Enhancement and Manipulation of Human Capacity to Perceive and Perform

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I. Project Statement

What are the social and individual implications of the manipulation of human natural characteristics and abilities related to sensory perception? The construct of society is determined by what members of that society perceive and how they interact in both competitive and cooperative manners. While nature and evolution selected a certain range of capabilities that imposed limits to the human capacity to perceive and perform, culture and technology have modified such abilities and changed the way we understand and interact with the environment

Sensory perception evolved biologically as a network of neuro-mechanisms ensuring the survival and reproductive success of Homo sapiens. The sensitivity of the sensory systems was selected to favor the range of interactions that humans could physiologically respond to through autonomic and cognitive reactions. The evolution of advanced cognitive capabilities and the consequential evolution of culture propelled humanity into an area of sensory perception beyond that of those derived through genetic evolution. Humanity began hence to seek ways to manipulate sensory

perception through conscious intervention in all steps along the operational chain of sensing—from stimuli to reception to neural processing, to obtain desired behavioral outputs.

The continuous pattern of such interventions through history suggests an innate desire to expand the boundaries of human neurobiology. By examining the history of modification, enhancement, compensation, and control of human physiological and psychological capabilities, this project will evaluate the impact of these manipulations so that causal relationships and predictive models can be conceptualized and studied.

A number of current trends are indicative of the contemporary significance of issues associated with the manipulation and enhancement of human senses:

- the level of investments by nation-states and private companies in the development of technologies enabling profound modifications of the human physiological and psychological capacities;
- the increasing availability of devices and technologies enabling sensorial modifications;
- the rise of ideologies such as post-humanism and trans-humanism;
- the acknowledgement of the potential beneficial effects of technologies (prevention of diseases, disabilities, etc.);
- the increasing fears of the consequences of an escalating competition between countries for developing such technologies (creation of super soldiers, a new social divide linked to the access to these technologies, etc.);
- the current debate about human enhancement that tends to polarize positions about the ethical or unethical character of these procedures.

In view of the challenges present societies are dealing with and, more importantly, will be facing in a not distant future, we believe it is urgent to start a comprehensive inquiry on the manipulation and enhancement of human capacity to perceive and perform to help contextualize and structure the discussion and enable a deep and useful understanding of the possibilities, risks, and opportunities.

This research focuses on elucidating the culture-evolutionary scope of the conscious manipulation of sensory perception by answering the following questions:

- 1) Are there socio-structural categories that can define the purposes of human manipulation of sensory perception? What correspondence is there between the complexity (e.g., as measured by investment, multi-sensory coordination, role of specialists, etc.) and purpose of sensory manipulation and the complexity of society?
- 2) What are the cultural mores and concerns regarding the modification of sensory capabilities and experiences of individuals?
- 3) What are the dangers and benefits of collective and mass manipulation of sensory perception to culture?

Our research aims at examining sensory manipulations and sensory enhancements from an interdisciplinary perspective that actively integrates humanities, social sciences, and hard sciences.

As a framework for our research, we will adopt the concept of intersensoriality. Recent scholarship in cognitive neurosciences is challenging

our understanding of sensory perception according to the traditional five-senses scheme and demonstrating that studying the senses in isolation is misleading—Human experiences involve multiple senses that interact. Intersensoriality should hence be seen as the most natural way of functioning of human perceptive capacities¹. A growing interest is emerging dedicated to forging more synthetic and comprehensive understandings of the human sensorium within the humanities. The field of Sensory Studies, for instance, is moving beyond the study of senses in isolation and there is a growing realization that cultural and social implications must be taken into consideration. Thus, the concept of intersensoriality presents a suitable framework for our inquiry that capitalizes on our individual disciplines and experiences.

This work will accomplish several research objectives that will advance our understanding of sensory manipulation and society. Specifically, we will:

- Identify theoretical and operational models of human manipulation of sensory perception that explain its evolutionary and historic development and provide context to evaluate sensory enhancement and manipulation for the present and the future;
- Elucidate the cultural motives and consequences for sensory modification to contribute to the dialog of how to maximize positive effects and minimize liabilities of tampering with natural capabilities;

¹ For example, research is suggesting that neurological organization does not follow discrete sensory regions in the brain to the degree previously accepted. Wallace, M. T., Ramachandran, R., & Stein, B. E. (2004). A revised view of sensory cortical parcellation. *Proceedings of the National Academy of Sciences*, 101(7), 2167-2172. doi:10.1073/pnas.0305697101

- Study multisensory manipulation from a historical perspective to better understand its role and meaning as a central aspect of science, medical intervention, entertainment, escapism, and education in human culture.

II. Interdisciplinary Aspects of the Project

We intend to move from multidisciplinary to interdisciplinarity, from juxtaposing and coordinating our home disciplines to linking and blending the methodologies and approaches to address issues and questions. Our research will involve several disciplinary fields within humanities (History, Philosophy), Social sciences (Archaeology), and Hard Sciences (Neurobiology, AI), as well as a number of fields that already characterize as interdisciplinary, such as Media Studies, Medical Humanities, Anthropology, Visual Studies, and Sensory Studies. Moreover, our scholarship as individual researchers is already moving across multiple disciplines. In that sense, we consider the most suitable way to foster interdisciplinarity is to begin with case-studies which should be sufficiently articulated and multifaceted to provide useful insights on the overall research questions. This will allow us to work on manageable aspects of intersensoriality and obtain presentable results at the end of the first year. The obtained outcomes will be compared, discussed, and combined in order to identify the directions for the subsequent phases of the project.

III. Research agenda for the first, second, and third year

First Year

During the first year, our objectives will articulate as follows:

1. Developments and Articulation of Research Questions:

Our first goal will be the development of our main research topic according to the four research areas we have identified:

1. purposes of sensory manipulations and enhancement;
2. identification of recurrent paths for pursuing it;
3. relationship between characteristics of the sensorium and characteristics of the social environment;
4. dangers and benefits of sensory benefits as synthesized from the past and contemporary cultures.

We will define and articulate these four areas of our inquiry and determine the degree to which each of them should be expanded, structured, and detailed, as well as the modalities of mutual integration of each of them within the overall project. We will identify concepts and approaches from our home disciplines and decide which theories, paradigms, and methods should direct the lines of our inquiries and which should be subsidiary.

Research will be conducted at an individual level within our home disciplines both intensively (within the frame of our case-study) and extensively (bibliography of secondary literature, identification of primary sources). Findings will be presented during our weekly team meetings in order to progressively identify points of contact between our disciplines.

We will establish a research agenda for the team encompassing literature reviews, abstracts for conference presentations and articles, discuss publication strategies and opportunity of funding. These meetings will also provide the opportunity for brainstorming sessions and sharing ideas. Finally,

they will foster the habit of working collectively, and facilitate the shaping and maintaining of the identity and coherence of the project.

2. Development of Collaborative Relationships Across Disciplines

In the first year we will promote connections and collaboration within the team members according to our individual scholarly interests and areas of expertise.

- Corinne and David: Critical analysis of concept of visual environment and ocular-centrism
- David and Jay: Analyze the use of multisensory theater and sensory manipulation in controlled sacred spaces to identify common areas of purpose and method.
- Corinne and Jay: Examine the historical efforts used for control of sensory perceptions

3. Funding opportunities

For the first year, we have identified some funding opportunities at an individual level.

At the present day, we have submitted applications for:

- 2020 Scholar-In-Residence Fellowship at the Deutsches Museum of München.
- 2020 Young Scholars Conference, depending on the grant (with Denis Sharapov).

Further opportunities will be studied after getting Russian residence.

Second Year

By the start of the second year, we should have provided a functional-structural conceptual model for approaching in a coordinated and cooperative way the history of sensory manipulation and be actively pursuing lines of inquiry related to special areas research and interdisciplinary lines of research. The team members will develop joint research projects and co-authored manuscripts.

The team will submit funding applications for the collective aspect of the project (both for research and publications). Active research will be made to locate the most suitable opportunities both within Russian-based funding agencies and from international organizations accessible through our international research networks (France, Italy, US, etc.).

We will also pursue multiple researches of partnerships for developing projects outside the academia.

Individual research agendas will include the goal of at least one related academic conference and the publication of at least one article in a Q1/Q2 academic journal for each team member

Third Year

In addition to continuing our basic research tasks, we will organize an open-event to present our work and provide the basis for development actively involving SAS, UTMN and tech-sector parties (private companies, etc.).

IV. Additional Team Members

In order to add cover core aspects of our inquiry and integrate crucial expertise, our team will include the following external members

- Marco Cambiagli, PhD, University of Verona (Italy), neurobiologist. Areas of research: environmental behavior; senses deprivation; history of neurosciences
- Marion Chottin, PhD, CNRS, Paris (France), philosopher of the senses. Areas of research: philosophy of the senses, philosophy of disability, ethics of neurobiology

V. Review Process

Two months before the review, our group will propose a ranked list of preferred external reviewers who have expertise related to our project topic. We would like to have one of these reviewers participate in the review project. This will allow us to receive focused feedback on our research from an expert in the field – and will also provide an opportunity for us to bring our research to the attention to a larger academic network.

VI. Individual Contribution and Statements

Corinne Doria: Vision, Medicine, and Society: Questioning the Ocular-centric Paradigm

The vision is responsible for about 70% of the information on the outside world perceived by a human being. Any deficiency of the ocular system consequently leads to an alteration in the social and professional relations, as well as a considerable reduction of the yield in the physical and intellectual activities. But what exactly is vision? This complex phenomenon can be analysed from several angles. First, in trying to give a minimal definition, we are led to distinguish vision as a process through which the eyes and the nervous system have access to information transmitted by the environment and visual perception, which concerns more precisely the cognitive aspects. Since antiquity, philosophers have thus questioned the role of vision in the process of knowledge and the more or less reliable visual perceptions, from Aristotle and Euclid, to English empiricists, to contemporary continental philosophers, such as Sartre, Husserl, and Merleau-Ponty. Studies on the psychology of vision started in the 1960s, has inquired the links between visual perceptions, neurons, and emotions. Considering the brain as having a major role in the phenomena of vision, the eye being ultimately a merely optical device that transmits to the central nervous system punctual electrochemical impulses, this disciplinary field has been studying how visual impulses are perceived and processed, finally producing meaning. The organs of vision have naturally received the attention of physicians. The development of ophthalmology as a medical speciality during the second half of the nineteenth century led to the definition of a normative framework of 'normal' vision by the medical

community, and a systematic process of manipulation of the human visual capacities aiming at correcting ‘imperfect’ or ‘abnormal’ vision. This normative framework has progressively penetrated several domains of social life. Criteria of visual efficiency have been introduced in the army and in different professions; vision tests have been adopted in schools. At the time, a debate involving physicians, scientists, and educators started debating on the possibility of enhancing human visual capacities through technical devices or medical interventions, or ‘educating’ human vision through environmental and behavioural modifications.

Although the learned debate and specialized literature have considered vision according to the classic Aristotelian five-senses-scheme, no consensual definition of what vision actually is (physical act? conscious perception?) has been formulated, and the artificiality of considering vision in isolation has become increasingly evident. The modifications and manipulations proposed by physicians have also found resistance within society (reluctance to go to the doctor to check eyesight, uneven adoption of standards in different professions, etc.). Moreover, if the medical discourse develops an ocular-centric narrative, culture and techniques at the same time embrace a broader and multifaceted conception of the vision, entailing the act of observing, perceiving, looking, and developments according to a line that considers vision not just as a passive reception of an impulse, but as an physical and emotional action.

The success eventually obtained by medical discourse and the enforcement of medical standards of ‘normal’ vision opened a debate about the consequences of visual impairments and visual deprivation. In a society in which 20/20 vision is the norm, a visual impairment is every value moving away from that norm. The acknowledgement of the social and cultural consequences of this situation became mainstream during the First World War, with the

thousands of servicemen returning from the front blinded or visually impaired. The political, social, and cultural implications of visual deprivation are a central point of the public debate in the inter-war period. Pushed by the necessity of social reintegration of maimed ex-servicemen, and stimulated by the activism displayed by self-advocate organizations of war blinded across Europe, the questions of compensation of lack of vision, substitution of visual perceptions, interaction of the senses, are studied in their theoretical and practical implications, as well as the emergence of perceptual capacities that medicine is unable to classify.

My individual contribution will move from a study of the eyesight at the interface of medicine, technology and the human. It will develop according to the following lines:

- Historical apprehension of the vision by medicine and technology
- Correction, enhancement, substitution of visual inputs
- Multi-sensoriality and vision
- Validity of the visual paradigm

Publication and Research Agenda

Conference participation:

Annual Meeting of the Canadian Society for the Study of Practical Ethics (CSSPE)- University of Western Ontario, London, Canada, May 31, 2020 - June 2, 2020 – paper on the debates on the use of devices for enhancing human visual abilities in the 19th century

Writing Health from the Eighteenth Century to the Twenty-First, 3-5 June 2020, Northumbria University, Newcastle upon Tyne, UK – paper on medical historiography of the vision (19th-21st century)

International Standing Conference on the History of Education ISCHE – Örebro, Sweden 19 – 22 August 2020 – paper on the education of the senses in French and Italian schools in the second half of the 19th century

Articles:

- “The "Plague of Studious Youth." Doctors’ Attitudes To School-Related Myopia In France During The ‘Belle Epoque’. Accepted with minor revisions by the *Social History of Medicine* (Q1) – final submission on November 2019
- “Defining and Assessing the Normal Vision: The Invention of Modern Eye Charts in the 19th Century” – to be submitted to the *Bulletin of the History of Medicine* (Q1) by November 2019
- “Vision and Intersoriality: Sources for an Interdisciplinary History of Visual Perceptions” – to be submitted by January 2019 to the *Journal of Sensory Studies* (Q2)
- “Discourses and representations of French blind veterans of WW1”- to be submitted to *Disability and Society* (Q2) by April 2020

Submitted funding application:

- Scholar-In-Residence Fellowship at the Deutsches Museum of München.

15,000 € for conducting research on the on the manufacturing and trade of optical lenses and on the cultural context of the development of vision aids in Europe and the United States (1850-1950)

David Melby: Cinematic Manipulation

According to our theoretical sequence of phenomena or “inputs” perceived and then processed by human beings toward some form of behaviour, I am specifically invested in understanding cinema or motion picture media as a permutation of synthetic inputs intended toward a behavioural consequence. But rather than reducing visual media to a form of mass manipulation or propaganda toward an ideology of some kind, I intend a more complex understanding of cinema as a form of *narrated consciousness*. I proceed from a fundamental understanding of narrative as *guided progression*. Narrative can then be understood as a form of human experience or, rather, as a perceived phenomenon. Narrative can then be understood as consciousness or, rather, as processed experience. It then becomes merely an exercise in appreciating *agency*, per se. That is, who or what is doing the guiding? In a dream, for example, a progression of images is narrativized and achieves a degree of coherence within the mind, as a *psychological* process of agency. In experience, the past is also narrativized, organized, filtered. And consciousness itself recognizes, categorizes, anticipates as it proceeds. Narrative is then perpetual. It only meanders through various *modes of agency*. Cinema is one such mode, and, of course, there are modes within modes. But narrated consciousness, as such, falls within a manipulative range between purest emulation and purest enhancement, neither of which has been accomplished but is nevertheless implied by the technological trajectory of motion picture media.

Space is another “mode” of agency in guided progression. That is, it may determine the parameters of the narrative process—what a narrative can and cannot be, or, rather, where it can and cannot progress towards. In cinema, we refer to this space as “diegesis.” Some theorists then differentiate “space” from “place.” Yi Fu Tuan, for example, posits, “If we think of space as that which allows movement, then place is pause; each pause in movement makes it possible for location to be transformed into place.” So a very particular mode of agency “pauses” movement through space and so narrativizes space as “place.” Painting, photography, and cinema accomplish this simply through choices of framing space. If we can understand how cinema narrativizes space through choices of framing, then we can also understand how this process organizes, filters, and contains, just as experience does. The most conventional cinema proceeds from its choice of framing toward a larger familiarization process ultimately achieving an agreeable, objective reality—a simulacrum of human consciousness. Subjective narrative, on the other hand, becomes a process of *defamiliarization*. In other words, when the mode of agency shifts from objective to subjective, from corporeal progression to thought progression, space becomes abstracted. It no longer exists except as a visual corollary for internal experience, or rather, psychological agency. Of course, this should be understood as simply another permutation of space as “place.” Thus, according to their legacy and implied future development, I am interested in exploring motion picture products each as a particular aesthetic agenda of sensory manipulation, whose creative choices affect a complex interplay between emulation and enhancement. Does their legacy necessarily imply an aggregate cultural will toward a virtualized reality then? Or does it imply something else? I hope to tackle these and related concerns, and with the help of outside expertise contributed by my research team members.

Plan of independent work for the first year:

1. November – December 2019: Literature review and preliminary drafting of an article probing “cultural implications of narrated consciousness as a form of sensory manipulation.”
2. February – May 2020: Drafting and submitting said article to Q1/Q2 visual culture journals for publication.

Publication and Research Agenda

Conference participation:

1. “Satanic Cinema in the Seventies,” *Images of Witchcraft: Cinema, Theater, Visual Arts*, Cluj-Napoca Faculty of Theatre and Film, Babeş-Bolyai University, Cluj, Romania, October 17-19. (Paper to be submitted to *Studia Universitatis Babeş-Bolyai - Dramatica* journal.)
2. “Pedagogy of Adaptation: The Case of Bierce’s ‘An Occurrence at Owl Creek Bridge’ as *Alfred Hitchcock Presents* and as *Twilight Zone* Episodes,” *2019 Literature/Film Association Conference: Reboot, Repurpose, Recycle*, Portland State University, Portland, Oregon, September 12-14. (Paper to be submitted to *Adaptation* journal.)

Forthcoming Publications:

“‘Twilight Zones’ of the Digital Age: The Newest and Original TV Series Juxtaposed,” *Essays on The Twilight Zone Franchise*, McFarland (forthcoming in Spring, 2020)

“Projecting the Visuality of the Beatles: *A Hard Day’s Night* (and *Help!*),” *The Beatles in Context*, Cambridge University Press (forthcoming in December 2019)

Submitted Applications for Research Funding:

1. National Endowment for the Humanities Grant (April 2019 deadline)

<http://www.Grants.gov>

2. Arts Writers Grant (May 2019 deadline; rejected)

<https://www.artswriters.org/application/>

3. Guggenheim Fellowship (September 2018 deadline)

<https://www.gf.org/applicants/apply/>

4. American Council of Learned Societies Fellowship (September 2018 deadline)

<https://www.acls.org/programs/acls/>

Jay Silverstein: Scentscapes, Sacred Spaces, and Virtual Realities

Theoretical framework:

While sensory perception is a neurophysiological adaptation, Homo sapiens separated from other species because of the evolution of culture which metamorphosized biomechanical attributes to function beyond their teleological genesis. The exaptation of sensory capabilities is first visible in the archaeological record as the deliberate manipulation of external stimuli for socio-psychological purposes. In other words, consistent with the evolution of culture, the first applications of sensory manipulation centered on control of the external environment in order to achieve a desired behavioral outcome. Socio-technological evolution increased the range of modification to include the creation of synthetic sensory adaptors and adulterated neurological processing with the looming prospect of direct biogenetic remodeling and design of natural sensory apparatus.

It appears that there are few general models describing the cultural purposes and consequences of sensory manipulation. The field has focused on either specific forms of modification (e.g., glasses, hearing aids, or microscopes), biomechanics, neurophysiology, or limited-scope studies of one form of sensory manipulation (e.g., use of hallucinogenic drugs in ritual or the impact of social media). Yet, there are apparent trends, purposes, and methods employed in sensory manipulation that, if categorized and integrated into more general functional-structural models of culture, could elucidate and inform issues related to human evolution, social power, *communitas*, scientific progress, individualism, and socio-psychological adaptive mechanisms for the current highly volatile technologically driven environment.

As an anthropologist/archaeologist, my contribution to the team research will focus on three areas:

- To assess the material and cultural evidence from past societies and ethnohistoric cultures and integrate that data into processual models of social evolution to support the generation of new models of the cultural use of sensory manipulation;
- To conduct an in-depth case-study of the manipulation of sensory manipulation in Egyptian religious contexts and integrate this study into established models of religious and socio-psychological theory as well as the model to be created by this team.
- To test the concept that 3D visualization and virtual reality can be used to advance science and pedagogy by creating diachronic multisensory models of ancient environments that will allow researchers and students to experience ancient sensory manipulations through reconstructed simulations and thus better understand the socio-psychological purposes underlying the manipulations.

Individual Funding:

Virtual Modelling of the Temple of Isis at Behbeit el Hagara. Awarded from the National Geographic Society, \$27,500. Work expected to begin April 2020.

Publication Plan:**Book chapters in Progress:**

- Sacred Landscapes in The Nile Delta and The Worship of Osiris: The Concordance of ideological and political Geography. Paper to be submitted for inclusion in the volume on the proceedings for the Conference: Rethinking Osiris, 26-27 March 2019, Florence, Italy. Submission Date: 30 Nov 2019. Jay Silverstein and Stacey Bagdi.
- Water, Worship and the Meanders of the Nile at Tell Timai. Paper to be submitted for inclusion in the volume of the proceedings for the conference: Sixth Delta Survey Workshop, 11-13 April 2019. Submission Date: 30 Nov 2019. Jay Silverstein and Stacey Bagdi.

Articles in Progress:

- Discovering some potential settlement areas around the archaeological Tells using the integration between historic Topographic Maps, Optical, and Radar data in the Northern Nile Delta, Egypt.
Abdelaziz Elfadaly, Mohamed A. R. Abouarab, Radwa. R. M. El Shabrawy, Wael Mostafa, Penelope Wilson, Christophe Morhange, Jay Silverstein, and Rosa Lasaponara. Accepted in the Remote Sensing Journal with revisions, October 2019.

- **The Perfume of Cleopatra.** Solicited article for *Near Eastern Archaeology*. Expected submission date November 2019. Jay Silverstein, Robert Littman, Dora Goldsmith, Hamdy el Mashaly, and Sean Coughlin.
- **Toward a Unifying Theory of Evolution: Consilience of Cultural and Biological Forces.** Previous article rejected September 2019. Under Revision with expected submission in December 2019.

Conferences:

- **Society for American Archaeology.** *Uncommon Scents: The Greco-Roman Perfume Industry at Thmuis, Tell Timai, Egypt.* Accepted for presentation April 2020.