



ENVIRONMENTS BY DESIGN

HEALTH, WELLBEING AND PLACE

AMPS PROCEEDINGS SERIES 26.2

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Environments by Design: Health, Wellbeing and Place

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INTRODUCTION

Environments by Design: Health, Wellbeing and Place

This proceedings publication is the outcome of the conference *Environments by Design – Health, Wellbeing and Place*, held in December 2021 as a virtual conference. It was coordinated by the research group AMPS, Syracuse University, Northumbria University, The Italian Society for Sociology of Health and Chalmers University of Technology / Center for Healthcare Architecture. The context for the event was the outbreak of COVID-19 and the subsequent lock-down that highlighted the important relationship between health and the spaces we inhabit. The impact it had on spatial activities as simple as commuting or meeting socially in public space are examples of this.

While the multitude of spatial effects evidenced by the pandemic make it tempting to see the concern about health and the spaces we inhabit as new, research and studies focusing health, wellbeing and spatial conditions have a long history pre-dating COVID-19. Seen in this light, the *Environments by Design* conference placed recent experience and responses against a backdrop of previous research into health, wellbeing and environments. Consequently, the conference brought together a diverse set of theorists and practitioners who examined a wide range of interrelated questions and issues from a range of disciplinary perspectives.

Examples of this diversity included analyses of the impact of the built environment on urban health, health related critiques of housing, and the spatial analysis of health facilities. It also included socio-spatial critiques related to ageing, spatial inequalities across communities, and the funding and planning of welfare institutions. Other scholars addressed the importance of socio-cultural factors and design as issues that impact the health and wellbeing of people in various ways. This diversity of approaches was also visible, and embedded, in the thematically focused sessions that structured the conference such as: Ageing and the Built Environment; Covid 19; Cultures, People, Place; Health and environments; Health facilities; Health, Wellbeing and Buildings; Healthy Cities; History, Colonialism and Health; Health and Housing; Interiors-Exteriors and Health; Mental Health and Designed Environments; Society and Health; Socio-political Built Environments; Technology, Cities, Health, and more.

The papers collected in this publication then, reflect the variegated nature of the conference themes and provide an in-depth exploration of current research related to built environments, health, wellbeing and place. The theoretical, historical and design approaches in each chapter (whether separately or in combination) provide the basis for the presentation of diverse ideas that move current scholarship forward. As evidenced by the politicization of the pandemic, this is more necessary today than ever, now that research competes in a world characterized by a flora of contested facts. It is a world in which we could argue that while there may be no truth, there surely are true facts.

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HEALTH AND NATURE: NEUROARCHITECTURE FOR THE RECOVERY OF HISTORICAL SPACES AND FOR HEALING FROM EATING DISORDERS. THE CASE OF VILLA ORTISI IN SIRACUSA, SICILY

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INTRODUCTION

Public health and environmental challenges facing the world in the 21st century, including the ageing population, increasing urbanisation, the rise of non-communicable diseases and climate instability, require an interdisciplinary response. The focus on wellbeing, in the definition of health and prevention of the loss of vitality, has been diluted and overlooked. Already in 1950s Halbert L. Dunn had defined the welfare of high level “as an integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable, within the environment (in which they) are functioning”. In simplest form, the goal of high-level wellness was life with energy, vitality and zest, and it could only be concretized as a ‘way of life’.¹

The urgent task for environmental health is to provide deeper insight into the ways in which we develop relationships with nature and building, and how we feel in the natural and artificial (built by man) world. This includes the social, political, and economic underpinnings of nature relatedness and its impact on vitality at all scales.

Architecture and environment have effects on humans at the cognitive level (understood as the processing and appraisal of perceived information) and the emotional level (understood as the adaptive reactions to the perceived information), which both operate through closely interrelated systems. For example, it has been found that noise and a lack of vegetation can generate stress that can even negatively affect life expectancy.² Thus, the architecture has cognitive-emotional repercussions. “Designerly ways of knowing” (distinct from the best-known scientific forms of knowledge³) has been, traditionally, the main way to address the cognitive-emotional dimension of architecture⁴. Through this way, architects have explored and exploited some of the perceptual foundations of the experience of space.⁵

For some decades scholars have been increasingly aware of the responsibility that architects have in designing places that can help man to live better and contribute to his well-being. Many experts have understood that living and working environments are fundamental to health and well-being.

In particular, today it is important to evaluate the influence of the physical characteristics of the places where man lives. In the current framework of the International Classification of Functioning, Disability and Health (ICF), such contextual factors are regarded as either facilitators of, or barriers

to, a person's functioning. This development mirrors recent interest within the field of architecture and design in the effect of man-made structures on the human central nervous system.⁶

Research explores the perceptual dynamics of man - space through the principles of neuroarchitecture.

NEURO-ARCHITECTURE AND REUSE

Neuro-architecture is the discipline that studies human behavior in response to interaction with different environments. Every place triggers a different reaction, emotion and thought in the brain.⁷

The perspective of work is to look for ways to give rise to innovative spatial concepts to relate architecture, mind and body. Neuroscience takes its inspiration from the holistic understanding of human life that Moholy-Nagy expected from architects⁸. She has certainly been an integral part of many of Arnheim's⁹ studies on visual perception and consolidates with Richard Neutra and his idea of incorporating neuroscientific knowledge into architecture¹⁰, reconciling scientific approach with field experience. Different and various study were done on light and acoustic by medical researchers.

At the end of the last century, the neuroscientist Dr. Fred Gage studied the effects of environmental changes on the mind that «interprets, analyzes and reconstructs the space that surrounds it». When you enter an environment, the brain creates cognitive maps that, in relation to spatial distribution, affect emotions. Gage's statement "Changes in the environment change the brain, and therefore they change our behavior"¹¹ stresses the interactions between spaces and behavior and the responsibilities that architects should assume regarding the effects of the project on the psycho-physical well-being of users.

The first examples of neuroarchitecture are related to the design of hospital structures. Roger Ulrich of Texas A&M University¹² conducted a study in the late 1900s on nature-based health design that, with architecture, cures those who suffer. A methodology that identifies, in the open space, ideal places for care of patients who can perform recreational, rehabilitative, social, playful and sports and are perceived as an extension of the health facility.¹³ It gives patients a feeling of greater autonomy, freedom and leisure, even when they cannot physically enjoy it.¹⁴

In 2003, the ANFA (Academy of Neuroscience for Architecture) was founded; it included many lines of research activities, conducted in synergy with the Academy of Health Care Architecture, aimed at the design of health facilities testing solutions, not only compatible with the health status of the occupants, but able to condition the therapeutic process towards healing.¹⁵

Although Neuro-architecture has its roots in antiquity, its application has been established in our century following the research that led to define the plasticity of the human brain: the ability to produce neurons in adulthood according to lived experiences. The implications in the field of architectural design have been developed around the definition of the quality of spaces able to improve cognitive functions, enhance mnemonic processes, control stress. Research by neuroscientists has shown that there are areas of the brain that activate when an individual is in a place and recognizes him on the basis of his accumulated memories or catalogues him as new and unknown. You can reduce the feeling, linked to the stress of the user entering an environment avoiding intense lights, crowding, sharp edges and placing more points of reference.

With the right application of the discipline, you can design schools in which concentration is facilitated, health facilities in which the emotional component, placed in the foreground, dominates the disease, offices in which the creative and productive component is encouraged.

Even the design of outdoor environments can see the contributions of neuro-architecture: nature helps the human psyche and improves mood, reducing stress. The environments surrounded by greenery or with a wide view of natural landscapes help to improve the psychological well-being of people.

The designer can therefore make use of the notions provided by neuro-architecture, such as the use of colors, which condition mood, decisions and attitudes:

- Yellow: brightens the poorly lit and small spaces;
- Orange: stimulates physical activity and respiratory and eye system;
- Red: increases visual complexity, stimulates nervous and glandular activity;
- Violet: used in small quantities shows analgesic effects;
- Blue: expands space and calms the nervous system;
- Green: stimulates brain activity, but if too bright is irritating;
- Brown: if it is made of natural material, it gives a feeling of comfort.

The research developed explores the possibilities of applying the principles of neuro-architecture to the reuse of buildings for health purposes. These interventions are governed by design processes organized around the assessments of compatibility between the quality and performance offered by the building and the requirements placed in the field by uses other than the original.

In the proposed case study, the audit concerned a disused building for its possible redevelopment for the health care of Eating Behavior Disorders patients. Such a project has to deal with a number of needs that fall under the most recent concepts of health care, such as:

- the humanization of the place of care;
- the suitability of spaces for specific therapeutic pathways.

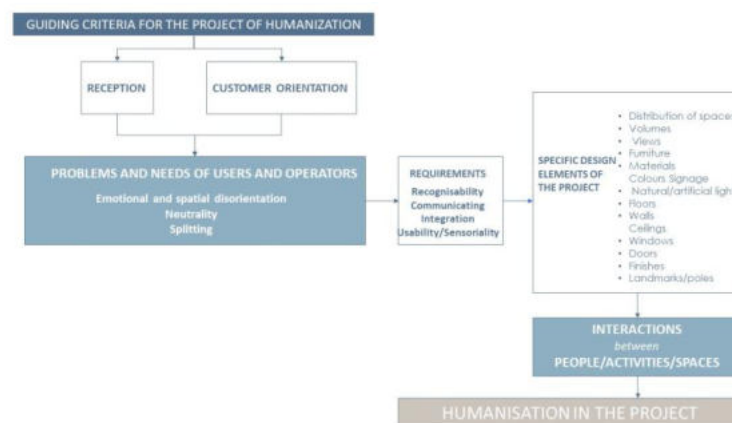


Figure 1. Criteria for the humanization project.

THE CASE STUDY: VILLA ORTISI IN SYRACUSE

Villa Ortisi is located in the Tiche district, one of the oldest districts of Syracuse, one of the five of Greek foundation, a holiday resort for wealthy families at the end of the Nineteenth century. The building was built by Cavalier Eustachio Ortisi (1852-1928), who was the Bank of Italy's manager, probably between 1885 and the beginning of the 20th century. The first official plan in which the villa is clearly visible is from 1925.¹⁶ The villa was sold to the City of Syracuse in 1931.

The building is a simple volume, on three levels, marked vertically and horizontally by the rhythm of large windows; it has a pavilion roof on which a terrace is inserted. There is a level under the roof, smaller and visible only on a prospectus. The façades have large rectangular windows defined by white stone frames of Syracuse and some small circular windows. On the original main façade there is a rectangular loggia composed of three arches on the long sides and one on the short ones, marked by columns with Ionic capital and trabeation. The decorative elements are a reinterpretation of shapes and styles, typical of eclecticism. Near the villa there are a small private chapel, rural buildings, a large garden and a gym built in the second half of the twentieth century. Compared to the villas in the area, Villa Ortisi is more imposing because it is set on three levels plus a semi-basement floor, instead of two.



Figure 2. Landscape framework and localization view of Villa Ortisi, Syracuse, Sicily, Italy.

Over time, the City of Syracuse divided the lot by renting the rural part to a Recovery Center for Drug Addicts (Rebirth Community) and placing on the land surrounding the Municipal Nursery.¹⁷ In the forecasts of several general regulatory plans the villa was to host an Institute for the reeducation of the blind or a retirement home for the elderly.



Figure 3. Historical evaluation of Syracuse and Villa Ortisi.

The villa hosted an elementary school from the late '60s until 2005, when it was abandoned for lack of seismic adjustment. A gym was built at that time.

A project for seismic and fire-fighting adaptation was drawn up in 2012, including the installation of an elevator and the construction of a new stairwell. These interventions were carried out by demolishing original floors and vaults. The works have never been completed, leaving walls and walls without finishes and systems. Today the villa has suffered acts of vandalism, has become a landfill of dangerous material (ethernit), has been illegally occupied by non-EU and has been infested by rodents and small animals.

RESEARCH AND THE PROJECT

The research applied the concepts of neuroarchitecture to the case study, deepening historical, sociological and functional aspects. In particular, the urgent requests for health services by the Community and numerous meetings with neuropsychiatrists of the hospital of Syracuse led to the determination that the villa should become a place of rehabilitation, also given the proximity to the hospital. The study carried out on the shortcomings of local and regional health services highlights the need to create places for the treatment of mental disorders, linked to food behavior. Such pathologies are difficult to treat, involve the family sphere and require periods of stay in special facilities because outpatient therapy is not enough. The best treatment is, according to all neuropsychiatrists consulted, a residential rehabilitation facility where the patient, depending on the stage of the disease, can follow a path of residential rehabilitation, semi-residential or outpatient.

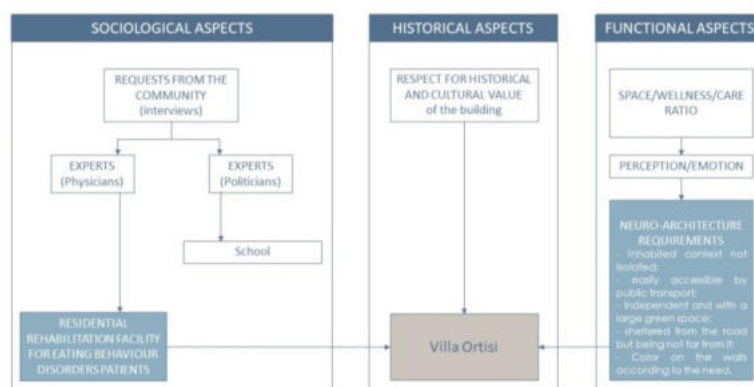


Figure 4. Method scheme for Villa Ortisi project.

The Resolution of the Sicilian Regional Council n. 14 of 2014 indicates the minimum requirements necessary to achieve a rehabilitative structure of this type; the research, through consultation of experts and the application of the principles of neuro-architecture, identified prerequisites for implementing a correct approach to the disease. A list of the areas to be covered during the design phase has been drawn up.

Functional-Distributive Requirements

- Rooms with one or two beds, respectively 9 or 14 sqm minimum, a wardrobe and personal spaces. All of these rooms shall be on one level;
- 1 bathroom for every 4 beds, outside the rooms and with the possibility of being closed after meals, with locks that can be opened from the outside, in case of emergency;
- n. 1 bathroom, and a changing room for medical staff;



Figure 5. Masterplan for Villa Ortisi re-use, Syracuse, Sicily, Italy.

- an infirmary for each floor, with spaces suitable for the preparation of therapies, a bed and cupboard and refrigerator for medicines;
- therapeutic laboratory spaces;
- recreational spaces;
- classroom study for underage patients attending school;
- a canteen equipped with tables with two or more positions;
- a kitchen of 12 square meters minimum, with the possibility of laboratory-therapeutic use, and open only if necessary;

- clinics, with a position for each doctor: 1 neuropsychiatrist of childhood and adolescence, 1 psychologist-psychotherapist, 1 social worker, 1 dietician;
- spaces for interviews and meetings;
- archive;
- a laundry, ironing and pantry;
- space for rehabilitative activities.

Requirements For Neuro-Architecture

- Located in an inhabited context not isolated;
- easily accessible by public transport;
- independent and have a large green space;
- sheltered from the road but being not far from it;
- Color on the walls according to the need: natural color (wood) gives feeling of comfort, the green stimulates brain activity and soothes, the blue expands the space and instills calm to the nervous system, the yellow brightens the environments little light, Orange stimulates physical activity and the respiratory system. Purple (although in small quantities it may have analgesic effects) and red are to be avoided; the latter stimulates nervous and glandular activity, sometimes too much;
- Wide green spaces and use of perspective views of green spaces, accessibility to green spaces in continuity with the interior;
- Limitation of sharp edges and net divisions;
- Limitation of mirrors and reflective surfaces.

From space distribution point of view, the villa Ortisi reuse project places all the functions necessary for the implementation of the most recent rehabilitation protocols. These are places to treat anorexia, bulimia and binge-eating (and the resulting obesity). The project aims to use spaces to prevent different pathologies from hindering each other.

The project foresees:

- the therapeutic residence inside the villa,
- the rehabilitation gym inside the gym,
- the upgrading of the football field,
- the outdoor space as an "extension" of the interior, through the placement of both therapeutic/rehabilitative and recreational activities.

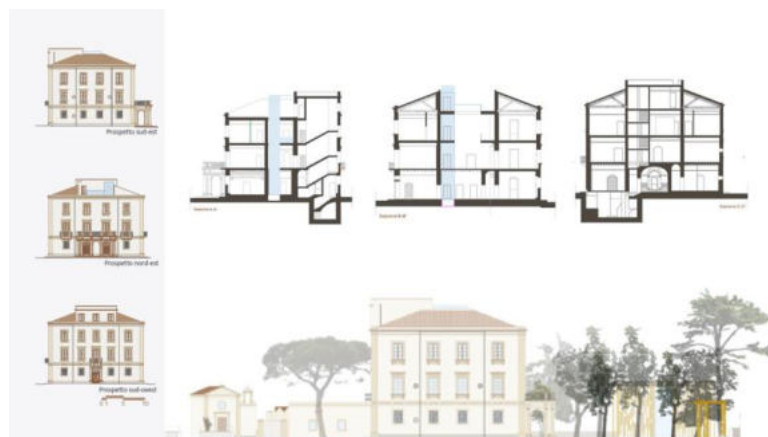


Figure 6. Project of Villa Ortisi, Syracuse, Sicily, Italy.

The internal and external modifications respect the constraints imposed by the Italian legislation for historical buildings of cultural interest: The functional distribution follows the consequential course of

the rooms and provides for the installation of a panoramic lift that brings lighter even inside. The project works by levels and according to the neuropsychiatric protocols provided for each pathology. On the ground floor the project places the outpatient activities (neuropsychiatrist of childhood and adolescence, psychologist-psychotherapist, social worker and dietician), therapeutic and administrative, with spaces for waiting, meeting room, stay for parents-children meeting. The first floor is intended for daytime activities and workshops (music and art workshop, study room, relaxation room, canteen with kitchen workshop). They are designed overlooking the green for each laboratory to give relief to the patient in a moment of inner conflict. The infirmary is strategically located adjacent to the bathrooms of patients. The second floor is intended for inpatient patients. These are double rooms (one is single but can accommodate a pet) customizable, overlooking the green of the surrounding park. The toilet block was placed in the middle of the building for security and control reasons.

On the top floor there is a laundry room adjacent to the roof terrace; in the basement there is an archive.

The project applies the principles of neuroarchitecture using natural materials, such as wood, in order to give patients a more serene, quiet and free of elements that can cause stress, so as to better live the path of care and green to soothe, comfort and feel integrated into the natural system. The neuro-architectural approach suggested to use the green as an extension of the villa with laboratory activities carried out outside and with garden therapy.



Figure 7. Project views of Villa Ortisi, Syracuse, Sicily, Italy.

CONCLUSION

The principles of neuroarchitecture reduce environmental stress and allow patients to maintain a sense of control. In addition, they are real positive distractions that favour, as Dunn said, the well-being of the highest level. They are the observation of works of art, listening to music, the proximity of a pet, watching nature or walking in nature, physical exercise. These principles apply to both the patient and his family and derive from studies on the effectiveness of care.

Despite the potential influence that architecture can give to the psycho-physical well-being of sick people, there has been relatively little commitment from public health to architects.

Joint public-private initiatives could be useful in achieving health realities capable of accommodating and resolving problems related to eating disorders. It is recommended to integrate health into both university and post-university education. Lastly, public health should contribute to building a database of information on health architecture and make it accessible to architectural professions, for example with plain language summaries or infographics, so that it filters effectively in policies and design.

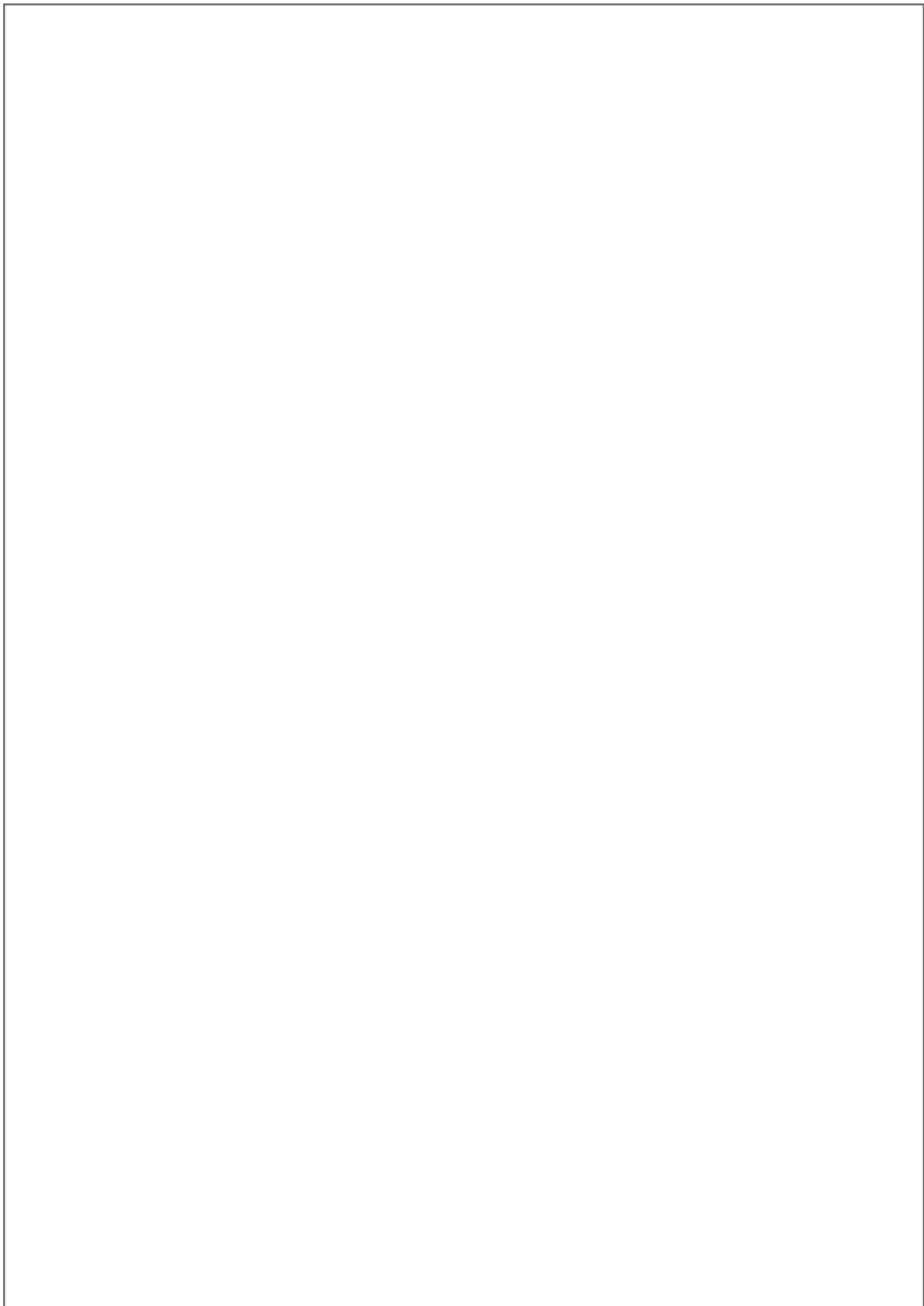
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