

# eMOTIONAL Cities

Mapping the cities through the senses  
of those who make them

DELIVERABLE 1.2

## Annual Consortium Meeting Reports I

31/12/2021



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|                                 |   |
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## Executive Summary

This document – Deliverable 1.2 - Annual consortium meeting reports – aims to describe the first Annual Consortium Meeting of the eMOTIONAL Cities project, its organisation, functioning, participation and main results.

This event, under the theme '**Planning & Design to foster mental health and well-being in our cities and citizens**', took place on 22 and 23 November 2021 in Lisbon, University of Lisbon.

The introductory text that framed the topic and was presented to the audience was as follows:

*«Cities have always claimed to be places of prosperity, development, progress, creativity, and innovation, at the same time as they offer opportunities and conditions for people to foster their life and to fulfil themselves. Although less commented, cities can also be places for societal stressors with a severe impact on people's mental health and well-being. As the world is becoming more urbanized and cities of the future need to be people-centered, robust evidence-based knowledge on the underlying biological and psychological processes, by which Urban Planning & Design influence brain circuits and human behaviour, will be critical for policy making on urban health. Emotions are key drivers of our decisions; similarly, our choices are the conduit for our well-being and health. In this conference we'll discuss how each one of us, scientists, decision-makers, politicians, urban planners and physicians, can help to shape healthier and well-being cities. We hope we could shed light on the advantages of living in such an urban environment.»*

The activities were distributed over the two days, as follows:

- On the 22<sup>nd</sup>, we had a close meeting – Scientific&Management Board Meeting – only for the consortium partners, where we assessed the current status of the project, analyse what has been done and discussed its course in the near future;
- On the 23<sup>rd</sup> we organised a public event, for Dissemination and Communication, on the theme '**eMOTIONAL Cities: Debate on the future of urban health**'. We had a talk by a guest keynote, who is also a member of the Advisory Board of the project, Prof. Angela Million.

All the bodies that belong to the eMOTIONAL Cities project management structure - **Management Board, Scientific Board, Advisory Board and Stakeholders Group** - were represented at the annual event.

Bellow, we present the detailed agenda, the respective participants, the communication materials, and the means of dissemination of the project developed for the two days.

# 1. Agenda

DAY 1 | Monday, the 22<sup>nd</sup> of November

## Private scientific & management meeting of the Consortium

Location: Salão do Senado da Reitoria da Universidade de Lisboa

---

|      |  |   |
|------|--|---|
| 9h30 | Welcome  | by Paulo Morgado                                  |
| 9h45 | Updates on the work packages & tasks in progress |   |
|      | <b>WP2 – Theoretical framework</b>               | by Zenia Kotval                                   |
|      | <b>WP3 – Data management and infrastructure</b>  | by Joana Simões and Antonio Cerciello             |
|      | <b>WP4 – Spatial analysis of urban health</b>    | by Ana Seraphim                                   |
|      | <b>WP5 – Neuroscience experiments</b>            | by Bruno Miranda, Gonçalo Lopes and André Almeida |

After each presentation, there was a time for questions and answers.

|       |   |   |
|-------|---|---|
| 11h10 | Coffee break  |   |
| 11h30 | Comments and advice from Advisory Board                     | by Angela Million                       |
| 11h45 | Open discussion   |   |
| 12h30 | Lunch break   |   |
| 13h40 | Updates on the work packages & tasks in progress (cont.)    |   |
|       | <b>WP8 – Dissemination, communication, and exploitation</b> | by Douglas Thompson and Liliana Paredes |
|       | <b>WP1 – Project management and coordination</b>            | by Paulo Morgado and Henrique Moreira   |
| 15h00 | Open discussion   |   |
| 16h00 | Closing   |   |

After 16:00, various working groups were organised per group work until dinner time.

|              |  |
|--------------|--|
| <b>19h00</b> | eMOTIONAL Cities <i>Magusto</i> (typical Portuguese winter gastronomic moment as a social event before dinner to celebrate our 1st live event and to toast the success of the project) |
| <b>20h00</b> | eMOTIONAL Cities dinner  |

DAY 2 | Tuesday, the 23rd of November

**Public event – eMOTIONAL Cities: Debate on the future of urban health**

Location: Salão Nobre da Reitoria da Universidade de Lisboa

|       |   |   |
|-------|---|---|
| 9h30  | Welcome & keynote speaker introduction  | by <a href="#">José Manuel Simões</a> ,<br>President of the Institute of<br>Geography and Spatial<br>Planning of the University of<br>Lisbon (IGOT) |
| 9h40  | keynote speaker Talk<br><b>“Feeling good in space. Changing spatial<br/>knowledge and influence on well-being”</b>  | by <a href="#">Angela Million</a> <sup>(1)</sup>  |
| 10h20 | Coffee break  |   |
| 10h35 | Introduction to roundtable discussion   | by the moderator <a href="#">Filipa<br/>Cardoso</a> Editor-in-chief of<br><a href="#">Smart Cities magazine</a> <sup>(2)</sup>                      |
| 10h50 | Discussion   Invited guests<br><br><a href="#">Miguel Telo de Arriaga</a> <sup>(3)</sup> , Head of the Healthy Lifestyles Division (DGS)<br><a href="#">Paula Castro</a> <sup>(4)</sup> , Professor of ISCTE/CIS-IUL<br><a href="#">Mário Vale</a> <sup>(5)</sup> , Professor of IGOT-ULisboa, CEG-Associated Lab TERRA<br><a href="#">Susana Macedo</a> , Clean&Safe - Turismo de Portugal |   |
| 12h30 | Full audience open discussion   |   |
| 13h00 | Closing   |   |

**(1) About Angela Million:**

Prof. Dr. Angela Million, is a Professor of Urban Design and Urban Development and currently serves as the Director of the Department of Urban and Regional Planning at the Technical University (TU) Berlin. She is also the Director of the “Global Center of Spatial Methods for Urban Sustainability” (GCSMUS) and an Adjunct Professor at Michigan State University. Before this, she was a researcher at the Institute of Urban Affairs (Difu) at TU Dortmund, Germany.

Professor Million studied Urban Design and Planning in Germany, Spain, and the US. She holds a Dipl.-Ing. from BTU Cottbus and a PhD from TU Dortmund. Her research focuses on participatory urban design, building and planning culture (Baukultur), with a special interest in educational landscapes and the development of multifunctional infrastructure. Her recent research explores spatial knowledge in planning processes within the collaborative research centre CRC 1265 “Refiguration of Spaces”. She is a founding member of JAS Jugend Architektur Stadt e.V., a non-profit association dedicated to architecture and the built environment education and participation of children and young people.

## (2) About **Smart Cities Magazine**:

Quarterly journalistic publication dedicated to the theme of sustainable smart cities, covering projects, solutions and trends in information technologies, environment, energy, water, waste, social innovation, health, education, urbanism, and mobility.

Smart cities are sustainable cities thinking about people, where social progress and well-being are the motto for the incorporation of urban projects and solutions.

The sustainability of the economy, society and the environment depend on this vision. Here, the aim is to build an optimized urban environment for the citizens. Knowledge, information, and management of these flows are the lever. The challenge? Combining the ambition of public administration with technological solutions and intelligent systems. The objective: to build efficient and useful solutions in the fields of education, health, the environment, the management of our resources (water and energy) and mobility systems and waste treatment. A challenge that forces us to reinvent cities, making them more competitive and providing excellent services. An equation in which the active participation of the citizens is a decisive factor.

The inevitable evolution of cities to smart cities and all associated activities represents a business that is marking the decade. At the forefront are the tech giants and thousands of other companies, fully committed to developing innovative solutions that allow us to do more with less.

## (3) About **Miguel Telo de Arriaga**:

Head of the Literacy, Health and Welfare Division at the General Directorate of Health. With work and project coordination in the areas of Health Promotion, Health Literacy, Criteria for the Definition of Good Practices in Health Promotion, and Implementation of Health Policies. Master's in clinical and Health Psychology and PhD student in Psychology.

Specialist in Psychosocial Intervention in Crisis and Emergency Situations and in Crisis Communication and Risk Communication. In addition to these activities, he is also a researcher with several published articles. Collaborates with different groups of international experts and European Joint Actions, in the areas of Chronic Diseases and Promoting Healthy Aging across the Life Cycle, Health Inequalities and Frailty, assuming, in the latter, the role of Quality Manager of the Joint Action.

He is also a collaborating member of the CRC-W – Católica Research Center for Psychological, Family and Social Wellbeing.

## (4) About **Paula Castro**:

Paula Castro is Professor of Psychology at ISCTE-IUL and a researcher at CIS-ISCTE. She holds a PhD in social and environmental psychology (ISCTE, 2000), and a degree in psychology (University of Lisbon, 1987). Her research looks at the processes of meaning-making and communication involved in the reception of new laws and public policies - mainly environmental ones - developing a social psychology of legal innovation. She has mainly investigated how new laws and regulations governing climate action, biodiversity conservation, public participation or urban regeneration are received by the public (e.g., contested, accepted, negotiated) and the implications of this reception for social change. The studies, both quantitative and qualitative, often focus on (the asymmetric) relations between public and scientific experts/decision makers. Other areas of interest are people-place relations, local knowledge, social memory and the history of social psychological theories.

She coordinated and participated in several financed projects (FCT, EU) and supervised various PhD and Pos-Doc projects, with the resulting work published in international journals of high impact in the areas of social, political, environmental and community psychology, as well as environmental policy. She was Director of the Psychology Department (2008–2010), Director of the PhD program in Psychology (2010–2013), Director of the master's in studies of Environment

and Sustainability (2015-19), Member of ISCTE's SC (2010-2014), and CIS-ISCTE SC (2016-19) and is currently Director of CIS-IUL.

**(5) About Mário Vale:**

Mário Vale has a Degree in Geography, a Master's degree in Human Geography and Local and Regional Planning and a PhD Degree in Human Geography from the University of Lisbon. He holds a position as Full Professor at the Institute of Geography and Spatial Planning, University of Lisbon. He was Visiting Research Fellow at CURDS (Centre for Urban and Regional Development Studies), at the University of Newcastle) in 2006 and a Fulbright Visiting Scholar at the Department of Geography at UCLA (University of California Los Angeles) in 2013. Currently, he is a Director at the Centre for Geographical Studies, University of Lisbon, and a member of ZOE research cluster in CEG.

He has been working on urban and regional economic change, especially in the European periphery, combining institutional, evolutionary, and political economy perspectives in economic geography. His research has been supported by several research projects of national and international (FP4, 5 and 6, Gremi-T, Integrated Actions and FCT).

He was President of the Portuguese Association of Geographers (2004-2008) and Vice-Chair of the Regional Studies Association (2008-2011) and is currently FeRSA (Fellow of the Regional Studies Association) and RSA ambassador in Portugal.

## 2. Participation

In the first day, of the annual meeting – **Private Scientific & Management meeting of the Consortium** – was attended by 35 members of the eMOTIONAL Cities team.

The **Management Board** was represented by the project coordination team and the project manager, both from IGOT.

The **Scientific Board**, chaired by IGOT and FMUL, was attended by the leaders of all the workpackages.

The **Advisory Board** was represented by Prof. Dr. Angela Million.

### Presences of the first day

|             |   |              |   |
|-------------|---|--------------|---|
| <b>IGOT</b> | Paulo Morgado<br>José Manuel Simões<br>Eduarda Marques da Costa<br>Mário Vale<br>José Luís Zêzere<br>Nuno Marques da Costa<br>António Lopes<br>Ana Bonifácio<br>Rajchandar Padmanaban<br>Tiago Filipe Silva | <b>CAMB</b>  | Elisabete Silva<br>Ana Paula Seraphim                           |
|             |   | <b>CLIMA</b> | Daniele Santucci<br>Ata Chokhachian                             |
|             |   | <b>NGR</b>   | André Almeida<br>Gonçalo Lopes                                  |
|             |   | <b>DTU</b>   | Carlos Lima Azevedo<br>Mayara Moraes Monteiro<br>Antoine Dubois |
|             |   | <b>TT</b>    | Sirle Samistu   |

|             |  |                       |   |
|-------------|--|-----------------------|---|
|             | Henrique Moreira<br>Carina Quintal                                       | <b>BYTEROAD</b>       | Joana Simões<br>Antonio Cerciello               |
| <b>FMUL</b> | Bruno Miranda<br>Marta Conceição<br>Leonardo Ancora<br>Diego Andrés Mora | <b>SPI</b>            | Douglas Thomson<br>Liliana Paredes<br>Omar Edin |
| <b>MSU</b>  | Zenia Kotval   | <b>UTARTU</b>         | Kadri Leetma<br>Kairi Kreegipuu                 |
|             |  | <b>Advisory Board</b> | Angela Million                                  |



Figure 1. Work session of scientific & management meeting of the Consortium



**Figure 2. eMOTIONAL Cities team members**

For the second day of the annual meeting – Public event - **eMOTIONAL Cities: Debate on the future of urban health** – we had 85 participants representing various stakeholders and end-users from the project.

In the streaming broadcast – <https://youtu.be/iMirrs003G8> – the respective recording was viewed, to date, by 223 people.

The main presentation was given by the keynote speaker, Angela Million, under the theme **“Feeling good in space. Changing spatial knowledge and influence on well-being”**.

The panel of guests for the round table represented several stakeholders, namely, the media through Smart Cities Magazine, the General Director of Health (Direção Geral da Saúde) of the Ministry of Health, Turismo de Portugal and Academia through ISCTE.

### Presences of the second day

---

**IGOT**

Paulo Morgado  
 José Manuel Simões  
 Eduarda Marques da Costa  
 Mário Vale  
 José Luís Zêzere

---

**FMUL**

Bruno Miranda  
 Marta Conceição  
 Leonardo Ancora  
 Diego Andrés Mora

---

**MSU**

Zenia Kotval

---

Nuno Marques da Costa  
 António Lopes  
 Ana Bonifácio  
 Rajchandar Padmanaban  
 Tiago Filipe Silva  
 Henrique Moreira  
 Carina Quintal  
 Afonso Batalha  
 André Leite Rodrigues  
 Angeliki Peponi  
 Carlos Davis Esperança  
 Carolina Menezes  
 Carolina Pais  
 Diana Pereira  
 Eduardo Gomes  
 Inês Portugal  
 Joana Santos  
 João Reis  
 Marcela Barata  
 Mariana Dias  
 Margarida Oliveira  
 Miguel Vilhena  
 Rafael Ramusga  
 Sofia Soares  
 Teresa Barata-Salgueiro

|                       |  |
|-----------------------|--|
| <b>CAMB</b>           | Elisabete Silva<br>Ana Paula Seraphim                              |
| <b>CLIMA</b>          | Daniele Santucci<br>Ata Chokhachian                                |
| <b>NGR</b>            | André Almeida<br>Gonçalo Lopes                                     |
| <b>DTU</b>            | Carlos Lima Azevedo<br>Mayara Moraes<br>Monteiro<br>Antoine Dubois |
| <b>TT</b>             | Sirle Samistu  |
| <b>EP</b>             | Joana Simões<br>Antonio Cerciello                                  |
| <b>SPI</b>            | Douglas Thomson<br>Liliana Paredes<br>Omar Edin                    |
| <b>UTARTU</b>         | Kadri Leetma<br>Kairi Kreegipuu                                    |
| <b>Advisory Board</b> | Angela Million   |

#### STAKEHOLDERS and END-USERS

|                                   |  |
|-----------------------------------|--|
| <b>Comunicação Social</b>         | Filipa Cardoso (round table moderator)   |
| <b>Ministério da Saúde</b>        | Miguel Telo de Arriaga (round table guest)                                       |
| <b>Turismo de Portugal</b>        | Susana Macedo (round table guest)  |
| <b>Câmara Municipal de Lisboa</b> | Ana Jara<br>Isabel Coelho<br>Paula Rebelo  |
| <b>Tartu City Government</b>      | Piret Väljaots   |
| <b>Academia</b>                   | ISCTE<br>FCSH, UNL<br>ICS, UL  |
| <b>Independent participations</b> | Carlos Liz<br>Carolina Augusta Backlar<br>Filipa Malcata<br>Catarina Sousa Rocha |



**Figure 3.** Public event: Debate on the future of urban health

## 3. Main contents

### 3.1 Day 1

Below we briefly present a state of the art of each of the work packages presented and discussed on day 1, by order of presentation, as well as some reflections and comments shared by our adviser, Prof. Angela Million.

## WP2 – Theoretical framework

### Results from Urban Environments and Mental Health Scoping Review

We aimed to conduct a scoping review of articles scanned from PubMed, Scopus, Web of Science, and ProQuest on Urban Environments and Health for journal articles published in English and from the year 2010 to 2021. With an initial number of 57 keywords in each of the two topics listed above, we got a result of over 7 million articles.

After multiple brainstorming sessions and search iterations where keywords were refined and narrowed down, our final scan with 10 search terms in Urban Environments and 4 in Health returned 6,902 articles. After removing irrelevant articles and duplicates, we were left with 495 articles to include in the scoping review. The review results were tabulated in an excel table where we extracted the following information from each

article: *Theory, Data Source, Variables, Analyses conducted, Results, and Limitations*. This information was then categorized into similar topics/themes. The following points summarize the main results of this review.

## Theory

- A total of about 105 theories mentioned by about 180 articles.
- Attention Restoration Theory was by far the most mentioned theory in the articles, mentioned 27% of the time.
- Stress Reduction Theory was the next most mentioned theory in the papers reviewed, it was mentioned 13% of the time.
- The third most mentioned theory was the Psycho-Evolutionary Theory, mentioned about 2.5% of the time
- This is followed by Environmental Restorative Theory, Appleton's Prospect-Refuge theory, Socio-Ecological theory, and the Theory of Planned Behavior, each mentioned 2% of the time.

## Data Sources

- Since articles could list more than one data source, we have about 580 data sources listed in the 495 articles reviewed
- Secondary data of populations such as Census data or Public Health Surveys by various States was used 25% of the time
- Similarly, literature reviews and meta data processing was used 25% of the time.
- Primary data through surveys or interviews was the third most commonly used source at 24% of the time
- Primary data from experiments were used another 15% of the time

## Variables

- Variables fell into about 120 categories from all the articles reviewed
- The largest category was Mental Health and wellbeing, which included variables such as depression, anxiety, ADHD, stress, etc., used 15% of the time
- The next most used category was Physical health and wellbeing, used about 9% of the time
- Tied with the physical health category was the Built Environment category, also used 9% of the time
- These results are understandable as these were the main categories of our scoping review keywords as well
- The next most used category was Access/Exposure/Proximity to Open Space/Green and Blue space, used 7% of the time

- Physical exercise or physical activity was used 5% of the time
- Level of “greenness/blueness” (different from access to these) was used 4% of the time
- Socio-demographic characteristics (such as age, gender, income, marital status) was used 3% of the time
- Social environment (support, cohesion, connectedness, capital) was used 3% of the time

## Results

- Since results could fall within more than one category, we have a total of 611 results divided into 22 categories
- 35% of the results connected green or blue space with better mental health.
- 15% of the results connected these spaces with better physical health
- 19% showed a relationship between the built environment and mental health
- 14% of the results mentioned the relationship between the built environment and physical health
- 5% of the results connected the built environment with social health
- Another 4% connected green space with social health/capital
- 3% connected environmental factors with overall quality of life

## Limitations

- 450 articles reported limitations that mostly fell within 10 categories
- The highest mentioned limitation was Methodological limitations, at 20%
- Inability to determine causality, reverse causality or the lack of temporal connections came in as the second most mentioned limitation at 15%
- The lack of generalizability came in third at 14%
- Quality of the data collected, including the lack of data availability was next at 12%
- Subjective measures in qualitative studies were mentioned 10% of the times
- Confounding variables that could not be teased out were mentioned 9% of the times
- Small sample size was mentioned 8% of the times
- Biases such as selection or self-selection were next at 6% of the time
- Search criteria involved in literature reviews were mentioned 4% of the time

## WP3 – Data management and infrastructure

### T3.1 - Requirement Analysis

We have conducted data interviews with partners of the eMOTIONAL Cities project, in order to understand their requirements in terms of data ingestion and publication. The results of this analysis show that the data collected within the scope of this project will be mostly geospatial and that there is a mix of proprietary and open formats being used, including some Open Geospatial Consortium (OGC) and community standards.

Most partners have the intention to provide metadata along with the data and they foresee the main recipients of these data as being the researchers or the general public (e.g.: Open Data).

### T3.2 - Design and implement SDI

The Spatial Data Infrastructure (SDI) will be a multi services architecture, built on standards and best practices and based on Free and Open-Source Software (FOSS) and tools. The main goal is to make data *Findable, Accessible, Interoperable* and *Reusable* (FAIR). To ease its deployment, it will be virtualized into docker containers and orchestrated with docker-compose. We have designed pipelines to deliver features, images and records, using a set of Open Geospatial Consortium (OGC) standards, including recent Open APIs, and SQL/NoSQL data stores. Some implementations can be found in the [eMOTIONAL cities GitHub repository](#).



Figure 4. Draft design for features (left) and images (right) pipelines

### T3.3 - Acquisition methodologies for real-time neuroscience and behavioural data

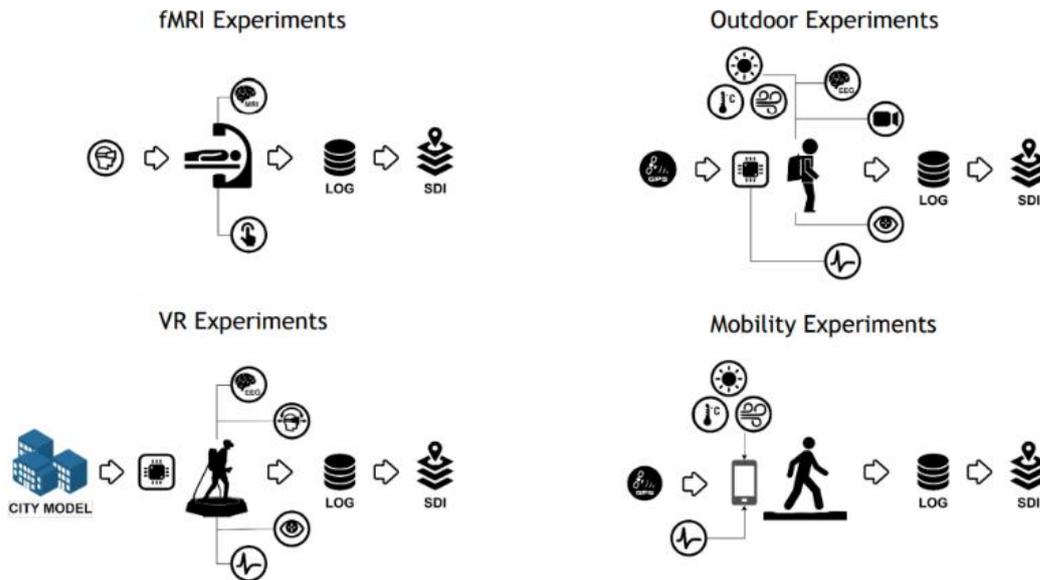
There will be four different types of neuroscience experiments developed in WP5 (Figure 3.2) for which we will develop a common set of acquisition methodologies which will facilitate the ingestion of experimental data into the SDI. To do this, we are working closely with the development of the experimental pipeline for WP5 to make sure we identify and document the standard data formats required for each experiment. Our goal is to understand the required geo-spatial, time, and other indexing attributes of interest which will need to be used both when sharing the results of the data internally between consortium partners or externally with the general public. We published our first dataset collected during the proof-of-concept

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outdoor experiments to the shared AWS S3 bucket data lake, together with a reproducible Jupyter Notebook which can be found at [emotional-cities/notebooks: Data analysis examples for the emotional cities project \(github.com\)](https://github.com/emotional-cities/notebooks).



**Figure 5.** Neuroscience experiments to be developed in WP5

## WP4 – Spatial analysis of urban health

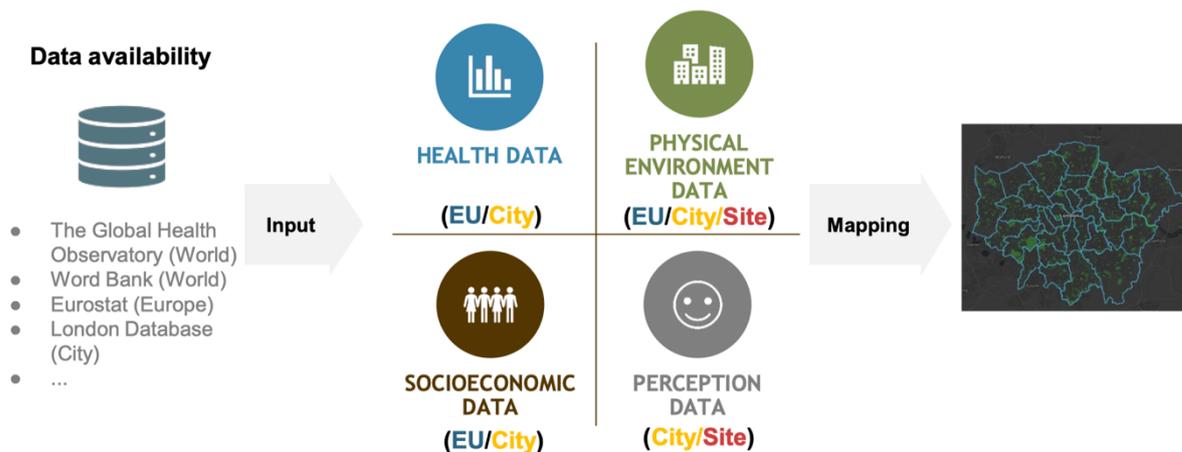
### Urban Health Variables

We review spatial variables and metrics related to urban health (via government reports, data used by project partners, scientific literature reviews, data available in multiple platforms), that are used to develop our spatial analysis strategy for our WP tasks 2 and 3. We are using a 3-layer strategy for the identification of variables and metrics, composed of a bottom-up, a science-to-policy, and a policy-to-science processes. Our presentation shows the result of scanning results for the policy documents (i.e., the policy-to-science process) for London and Lisbon, which will be complemented by the World, Europe, Copenhagen, and Lansing levels. We extracted from the reports the same 3 types of variables of the bottom-up process, which are: physical environment variables, health variables, and socioeconomic groups variables.

These 3 types of variables are organised in relation to 7 topics, identified in the reports as important urban characteristics regarding health improvement: (i) healthy food environment; (ii) crime prevention environment; (iii) active travel environment; (iv) multifunction open spaces; (v) environmental exposures; (vi) social, work, and housing infrastructure; and (vii) land use. We are going to present in this section each of the 3 types of variables identified in the reports relating them with the 7 topic groups.

## Urban Health Mapping

Spatial analysis of urban health heavily relies on the data availability in terms of coverage, granularity, consistency with all cases, etc. Thus, to build an operational spatial analysis Framework (Figure 6), we first gather available data, including government data, public open data, and other data sets that can be accessed with licenses. Then, we identified data that are available for the spatial analysis of urban health in the following four themes: health outcomes, physical environment data, socioeconomic environment data, and urban perception data. Under each theme of data, we also identify the variables and metrics for spatial analysis.



**Figure 6 Framework of spatial analysis of urban health**

## Sentiment analysis and hotspot identification

By conducting sentiment analysis of geotagged social media data, this helps to identify the prevalence of the positive/negative sentiment or specific emotion in local places and further identify the hotspot areas of different emotional reactions in cities. We present the methodology including data collection, processing, sentiment analysis and mapping of geotagged social media data (Figure 7). We use the methods to conduct pilot studies of data collection and preliminary sentiment analysis in London, Lisbon, Copenhagen, and Lansing on 07-21-2021 (Wed) and 07-25-2021 (Sun).



**Figure 7 Workflows of sentiment analysis**

## WP5 – Neuroscience experiments

### T5.1 – Implementation of VR/AR environments

A requirement analysis for the AR/VR-related technology to be acquired and used throughout the project was performed. The technology platform was developed to allow the robust replay of georeferenced data. An urban environment of a specific area within one of our case-study cities (Lisbon) has been already modelled. We discussed the appropriate type of urban features to be used in the experiments (e.g., street-level facades, city landmarks...) as well as the main confounding variables (e.g., building form, colour, texture...). The overall conclusion was to set priorities (given the time-consuming), make evidence-based decisions and consider alternatives such as “standard” VR cities.

### T5.2 – Integrative data collection and analysis for neuropsychometrics and biosignals

The integration of the wide range of behavioural (position and orientation of the subject in the real environment), physiological measurements (heart rate, galvanic skin response...) and environmental features (air quality, temperature, humidity...) has been already tested in a common acquisition framework based on the Bonsai programming. This has included the set up for the indoor experiments as well as the outdoor testing.

### T5.3 – Development of behavioural paradigms and neuropsychometrics protocol

Each protocol of the five defined experiments was discussed according to their objectives, relevant behavioural task or paradigm, specific methods (including self-reported questionnaires, physiological sensors and neurotechnologies) and metrics (quantitative or qualitative). Despite being a vivid document, the protocols are expected to be the foundation for our next empirical steps of studying how particular features of the urban environment and individual biological inequalities relate to cognitive and emotional processing.

## Comments and advice from Angela Million

At the end of the morning session, Angela Million made general comments on the workpackages presented, focusing in general on the concept and development of the eMOTIONAL Cities project.

We highlight the following comments:

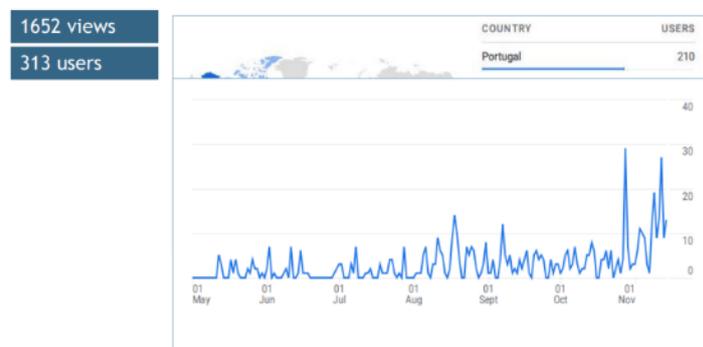
- It is fundamental to take into consideration that inhabiting places today is not the same challenge as in the past.
- There are current challenges that we are facing all over the world, in the middle of the 21st century, such as:

- Ecological challenges;
  - Pandemics;
  - Instability and insecurity; and
  - Digital transition.
- The perception of space is a turning point, and we need to take that into spatial experience account.
  - Other issues on personal strategies that are key to evaluate public space are those of gender and age: men and women have different ways of appropriating, experiencing, and living urban public spaces; as do children and young people who, more than ever, face the new dynamics of a digital world that implies new approaches to capture their attention to the use of urban outdoor spaces.

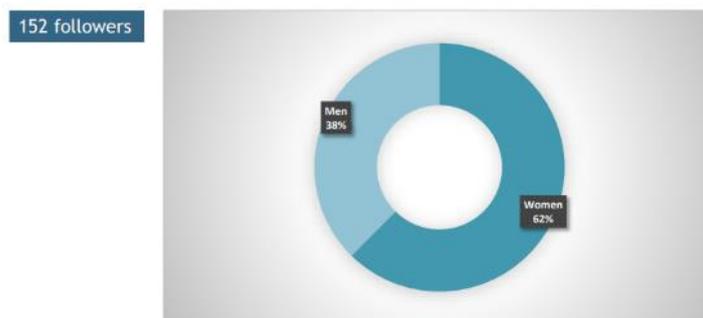
Angela Million said that during her presentation the following day, she will tap into the topic of some of the questions discussed and provide answers to many of them.

## WP8 – Dissemination, communication, and exploitation

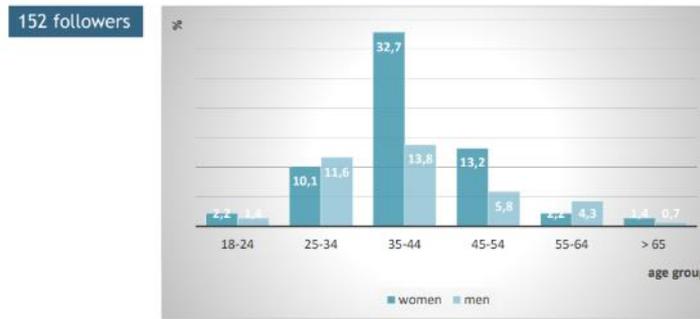
SPI made the initial presentation of the WP8 development and presented some indicators regarding the website and social media usage presented in the following graphs:



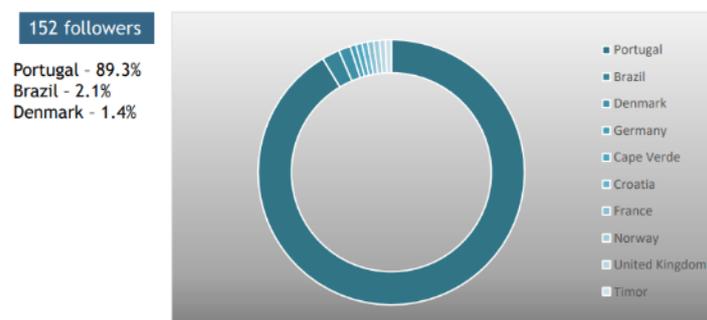
**Figure 6.** Website analytics  
(<https://emotionalcities-h2020.eu/>)



**Figure 7.** Social media analytics – Facebook | Gender  
(<https://www.facebook.com/emotionalcitiesproject>)



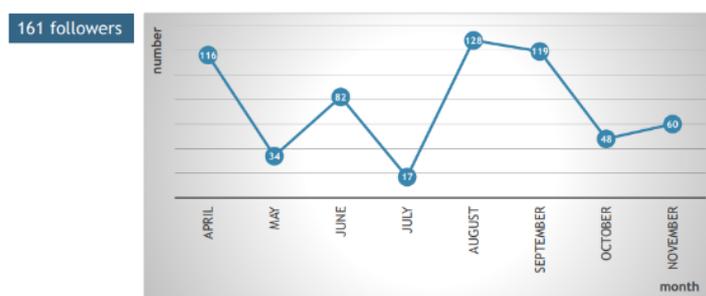
**Figure 8.** Social media analytics – Facebook | Gender and age group  
(<https://www.facebook.com/emotionalcitiesproject>)



**Figure 9.** Social media analytics – Facebook | Country  
(<https://www.facebook.com/emotionalcitiesproject>)



**Figure 10.** Social media analytics – Profile visits and Twitter impressions  
(@CitiesEmotional)



**Figure 11.** LinkedIn – Profile views  
(<https://www.linkedin.com/company/emotional-cities>)

Next, SPI presented the schedule of *posts* to be implemented in the social networks during the month of December 2021, as well as a summary of the webinar – visual identity – held on September 7th.

In a summary table (below), the key performance indicators of WP8 were also presented.

| Tools/channels             | Indicator   | Target value   | Status M1 - M8   |
|----------------------------|---|--|--|
| Project website            | No. of web views                                  | 10000  | 1652 views   313 users   |
| Social Media               | No. of views / shares / followers                 | 96 posts per channel, 1000 shares and views total, 1,000 followers total | Facebook - 31 posts   152 followers   262 views   27 shares                      |
|                            |   |  | Twitter - 24 tweets   45 followers   351 views   40 retweets                     |
|                            |   |  | Linkedin - 23 posts   161 followers   411 views   11 shares                      |
| Brochures/Flyers           | No. of Brochures/flyers distributed               | 1000 Brochures/flyers distributed online/offline                         | 250 flyers printed   |
| Awareness raising webinars | No. of Webinars organised and no. of participants | 8 webinars with 200 participants total                                   | 1 webinar   15 participants  |
| eMOTIONAL Cities Events    | No. of events organised and no. of participants   | 4 events with 500 participants in total                                  | 2 events<br>eMOTIONAL Cities Kick-off Meeting<br>eMOTIONAL Cities Annual Meeting |

**Table 1.** Key Performance Indicators

Regarding monitoring and reporting SPI invited partners to:

- Contact SPI about any major dissemination and communication action to be done;
- Provide a briefing after the action;
- Collect evidence of the actions implemented;
- Provide an updated list of dissemination and communications activities.

## WP1 – Project management and coordination

The WP1 presentation focus on overview of the first year (9 months) of the project work, regarding work packages, tasks and general performance according to with the objectives upfront identified and written in the proposal. Moreover, expected future steps of the project were also highlighted. On that regard, several topics were brought up for discussion, namely:

The matter of the **Urban Health Cluster**. More precisely, the five workgroups and their projects were presented, with emphasis on those in which eMOTIONAL Cities participates as coordinator, e.g. WG2 and WG4:

- WG1: Science translation for policy and practice (URBANOME, ENLIGHTENme)
- **WG2: Health determinants and urban interventions (eMOTIONAL CITIES, WELLBASED)**
- WG3: Data analysis and protection - digital platforms (RECETAS, HEART)
- **WG4: Urban issues and epidemics (HEART, WELLBASED, eMOTIONAL CITIES)**
- WG5: Dissemination, Communication and Exploitation (URBANOME, HEART)
- WG6: Citizen science approaches to urban health including ethics (ENLIGHTENme, RECETAS)

Although we have the joint coordination of the WG2 and WG4 that does not mean that we only take part in the activities of this two WGs'. Quite the contrary, eMOTIONAL Cities through the beneficiaries should be involved in all the WG's, and therefore everybody was invited to express their interest in the different WG's in the following days.

The state of art regarding **Milestones and Deliverables** were presented, with highlight on those that are still to be delivered according with the Gant Chart.

The **Risk management plan** was also assessed, namely the critical eMOTIONAL Cities for implementation.

Another matter addressed was the issue of gender equality. According to the EU – Article 33, 33.1 Obligation to aim for gender equality), states that «the beneficiaries must take all measures to promote equal opportunities between men and women in the implementation of the action. They must aim, to the extent possible, for a gender balance at all levels of personnel assigned to the action, including at supervisory and managerial level.»

«At European level, the gender perspective **is assumed to be essential to the social organization model and was adopted as a strategy to promote equality between women and men and to fight gender discrimination.** The objective of the integration of gender perspective in Member-states lies in the transformation of unequal social and institutional organizations into egalitarian and fair structures for women and men. It therefore involves incorporating the gender perspective in policy preparation, implementation, monitoring and evaluation.» (in IGOT Gender Equality Plan, p.5)

It worth to mention, that IGOT has implemented a Gender Equality Plan, effective since 2020, that falls within the premises of the European Union for gender equality.

In this context, the IGOT is completing an online questionnaire to be answered by all the project beneficiaries (for internal dissemination) regarding gender equality assessment. This survey will be disseminated in early 2022.

Other management issues discussed in the WP1 presentation relate to the following aspects:

**Deliverables:** timings to be observed in preparation and submission

**Data Transfer Agreement (DTA):** Have early dates for circulation of the document and collection of comments by all partners before the necessary final review for the consolidated version and respective signature. The proposed date was January, 21<sup>st</sup>, 2022.

**Relevant financial and administrative issues:**

To execute according to plan:

- Buy on time and within budget

To execute according to national rules

- Example: depreciation on equipment

To execute under the ERC Grant Agreement rules

- Ask when in doubt
- Actively participate on reports to the ERC

To keep administrative tasks on schedule

- Example: timesheets

To keep Management Support duly informed

- By submitting a report every couple of months containing (at management meetings):
  - Execution
  - Status on equipment and HR
  - Timesheets duly signed

**Consortium Agreement:** anticipated dates for circulation and collection of comments until the necessary final review by Partners of consolidated version and respective signature (by end February 2022).

## 3.2 Day 2

In the second day, as stated, we had an open session which involved:

- A presentation by the keynote speaker - Prof. Angela Million;
- A round table with the participation of the following guests:
  - Filipa Cardoso (from the Media sector and taking the role of moderator);
  - Prof. Angela Million (Advisory Board of the eMOTIONAL Cities project);
  - Miguel Telo de Arriaga (General Directorate of Health);
  - Prof. Paula Castro (ISCTE);
  - Prof. Mário Vale (IGOT); and
  - Susana Macedo (Portugal Tourism Office).

## **Presentation of Prof. Angela Million**

Prof. Angela Million gave a presentation on the research ongoing in her University on Re-figuration of Spaces (CRC – 2018-2022) which has certain similarities with eMOTIONAL Cities.

She presented a series of ideas/findings of such research, revealing a book will be developed, to be published in 2022: *The Evolving Spatial Knowledge of Children and Young People*, Routledge 2022.

In her presentation, Prof. Million focused on the changes on how young people percept space and how such perception changed since the 1970s.

Among the research most important findings were the fact that young people spend much more time, today, at home, something that has changed the way they percept space around them: adding virtual space to the physical space and, with relation to the latter, increasingly valuing aspects as security and diminishing actual knowledge of the space.

In Prof. Million opinion, cities designers, these days, value more and more security in their designs.

Another aspect flashed by Prof. Million was the fact that young women face more control “bag” than young men, when it comes to the perception and use of spaces, leading designers to being highly sensitive on the matter of gender.

Also, people in the North Globe tend to be more refined in identifying improvements needed in the spaces, being concerned about issues has sustainability, maintenance, among others that are less seen in the South Globe.

(See in Annex 1, below, Angela Million's presentation).

## **Round Table**

The round table was moderated by Filipa Cardoso (Smart Cities magazine) and we highlight the following ideas taken from the guests' interventions:

Prof. Paula Castro expressed the idea that the link that needs to be studied is the one between urban choices and people's well-being (in a broad sense). To her, a successful city is one that has vibrant neighbourhoods (community), diversity of green spaces that allow for solitude time and spaces that allow for people to feel anonymous.

In a second intervention, Prof. Castro talked about the different impacts people sustain in cities: direct, such as pollution, and mediate, requiring interpretation, suggesting people are so different from one another that the best course of action to enhance cities quality of life is for designers and politicians, in fact, ask them about what they want for their cities.

Miguel Telo de Arriaga talked about the challenges involved in getting academic knowledge to impact on city policies and, finally, on cities. Mr. Arriaga stressed that it is up to Academia, designers, and politicians to make healthy choices the easiest ones available, thus enabling their application.

Later, in his second intervention, Mr. Arriaga referred to some challenges for the future of cities, such as the increasingly elder population or the inclusion of migrants, with their cultural differences.

Prof. Mário Vale talked about how cities policies are, in the XXI century, far more complex than those seen in the XIX century, when most of the policies related to pollution, in light of the industrial revolution. This increase in complexity advises designers and politicians to involve the Community in their decisions, something that is, for example, is still not as usual as it should be in Portugal.

In a second intervention, Prof. Vale disserted about the use of the new technologies in decision making on cities, stressing that the goals of smart cities are not necessarily aligned with higher quality of life of the citizens and, as such, smart and emotional cities will need to find a balance in the future.

Susana Macedo talked about the stamp “Clean & Safe” and how it helped tourism agents to go cope with the COVID pandemic while it produced changes in the space’s perception by tourists. Later, when asked, Ms. Macedo stated that the principles of “Clean & Safe” could be applied to cities as a way to enhance tourism and general well-being of the populations.

Finally, Prof. Angela Million talked about the challenge of taking urban knowledge to decision makers, stressing that health and urban policies should integrate with educational policies, allowing for integrated policies that could be easily understandable.

Prof. Million ended the round table, with her second intervention on the risk of cities becoming “less human” if decisions are taken on the basis of big data and statistics without understanding what such powerful basis “can and cannot do”. She ended up stating that “giving the people the chance of living a good life is not necessarily the same as making cities perfect!”

After the round table participants could make questions to the guests who elaborated further in the ideas expressed above in a very prolific environment.

## 4. Communication and dissemination

In the communication and dissemination process of the 1st annual meeting of the project, many resources and products were taken into consideration.

**The elaboration of a film presenting the eMOTIONAL Cities project.** This video followed a script and was built from the images collected on the day of the first outdoor test of interoperability of some of the technology acquired to collect individual and environmental data, e.g. Biosensors, noise level, weather sensors, eye-tracking sensor, air pollution level (PM2.5; PM5 and PM10), along with a capture of a collection of 360° images of the city, and other collection of film-images of Lisbon made for that purpose.

This film required the collaboration of a large part of the project team who were directly involved in the making of the film.

| Filming 12.09.2021  | Filming 16.10.2021   | Script and Post-production   |
|---|--|--|
| <ul style="list-style-type: none"> <li>- André Almeida (NGR)</li> <li>- Gonçalo Lopes (NGR)</li> <li>- David Palma (OEPS)</li> <li>- Paulo Morgado (IGOT)</li> <li>- Bruno Miranda (FMUL)</li> <li>- Ata Chokhachian (CLIMA)</li> <li>- João Vasconcelos (IGOT)</li> <li>- Tiago Filipe Silva (IGOT)</li> <li>- Ana Bonifácio (IGOT)</li> <li>- Leonardo Ancora (FMUL)</li> <li>- Marta Conceição (FMUL)</li> </ul> | <ul style="list-style-type: none"> <li>- Paulo Morgado (IGOT)</li> <li>- Bruno Miranda (FMUL)</li> <li>- Leonardo Ancora (FMUL)</li> <li>- Marta Conceição (FMUL)</li> <li>- Diego Andrés Mora (FMUL)</li> <li>- Angeliki Peponi (IGOT)</li> <li>- Rajchandar Padmanaban (IGOT)</li> <li>- Ana Bonifácio (IGOT)</li> <br/> <li>- Samuel Amaral<br/>(Captação de Imagem)</li> </ul> | <ul style="list-style-type: none"> <li>- Danbee Kim (NGR)</li> <li>- Ana Bonifácio (IGOT)</li> <br/> <li>- Estúdios FCCN (FCT)</li> <li>- António Barbot<br/>(Edição e Vídeo)</li> </ul> |

The preparation of communication materials according to the "Dissemination and Communication Plan I" (Deliverable 8.1) and the "Dissemination and Communication Materials Developed" (Deliverable 8.2) was an important dissemination support for the annual event.

In this sense, we produced the eMOTIONAL Cities and Urban Health Cluster flyers, the Roll-Up of the project that was on show during the two days of the event at the Rectory of the University of Lisbon and also other merchandising materials to support the communication of the project not only to institutions but also to citizens in general, such as bags, notebooks, t-shirts, sweat-shirts, etc.).



**Figure 12.** Merchandising materials produced to promote the project and the event

In addition to the dissemination carried out with the social networks - Facebook, Twitter and LinkedIn - the Smart Cities news article, with a highly technical article (readable in Annex 2), gave enormous visibility to the project:

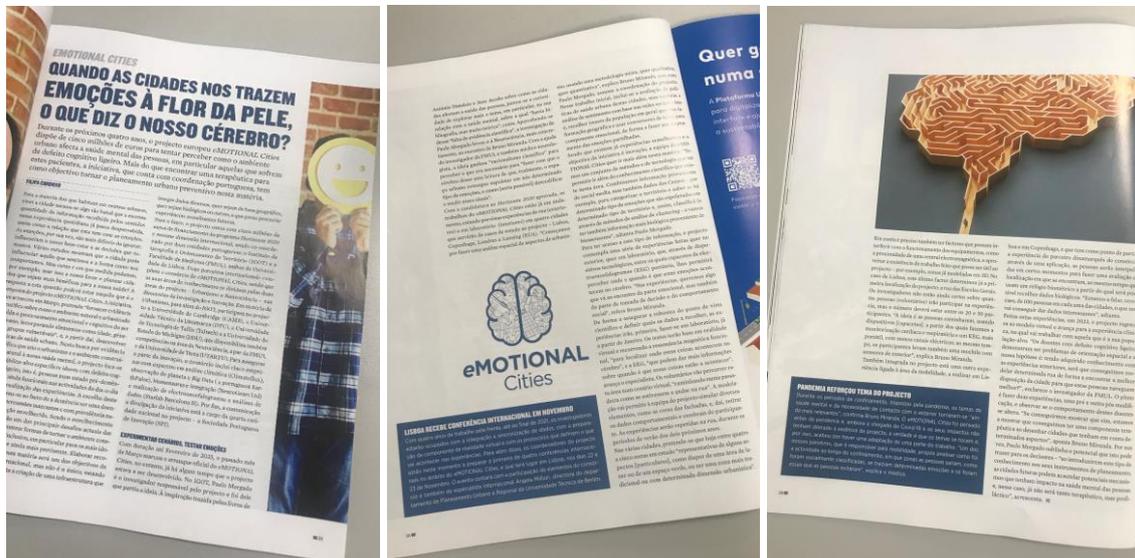


Figure 13. Images from the news in the Smart Cities print magazine

## 5. Main conclusions

The face-to-face synergy that was provided between the team was very positive and allow the sharing of knowledge, experiences and ideas that were lacking on the online meetings. The possibility to have this live meeting, stresses the importance of the informal conversations and the side meetings that can take place between partners when we are closer to each other.

Nonetheless, we have been able to overcome the travel restriction imposed by the pandemic, and the work in progress is as planned for the first year of activities and is therefore in line with the Grant Agreement (GA 945307).

Regarding the Dissemination on social media, we agreed that actions should have started earlier in order to get a higher number of registrations and participants.

The same, regarding the preparation of the physical materials for this meeting. It was recognized that it should have been prepared earlier.

Another topic that was discussed by Prof. Zenia Kotval and followed by the Estonian partners, was the place and date for next Annual meeting of the project. Prof. Zenia that is in charge of the organization of the [International Urban Planning and Environment Congress](#) taking place in Tartu, Estonian, on the 29<sup>th</sup> July 2022 proposed that the 2<sup>nd</sup> Annual meeting of the eMOTIONAL Cities will be in Tartu, and at the same time, so we

GA 945307

Deliverable 1.2 | Annual consortium meeting reports I  
December 2021

could take advantage of the UPE Conference for Exploitation, dissemination and communication. All partners agreed with the idea and decided together and unanimously.

The topic of publication, now that we started to have the first results regarding literature reviews, and some methodological protocols regarding data capture, validation and analysis, was also discussed. On that regard, everybody agreed that we always should adopt policy of open science. Participation in conferences either invitation, or by submitting abstracts for communication, and preparing joint papers, and special issues, were also a matter of discussion and point out as next steps activities.

Overall, we have agreed that having this 1<sup>st</sup> Annual meeting live instead of online, was not only highly appreciated by all but also very important for the delineation of the next steps, and to strength the commitment of all partners with the objectives of the project.

## **Acknowledgements**

The success, or failure, of such an event organization depends on the collaboration and the support of many. In that regard, we want to express our sincere thanks to the following persons from IGOT: Ana Paula Carreira, Fernando Benedito, Joana Santos, José Presas, Sandra Domingues, Maria João Raimundo, Paula Moleiro, João Anastácio, Miguel Gomes, Jeanna Campos Cunha, Andreia Costa, Luís Alves, Fernanda Rosa and Pedro Monteiro.

# Annex 1

## Feeling (Good) in Space

### Changing Spatial Knowledge of Young People and Influences on Well-being



**Prof. Dr. Angela Million**  
 Technische Universität Berlin, Dep. Urban Design and Urban Development  
 Global Center on Spatial Methods for Urban Sustainability











Slide 1/18



**Central Research Question:**

How did the spatial knowledge of young people change since the 1970s?

- Which processes of transformation can we identify?
- How did/do children and young people perceive, use and appropriate spaces?

Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts

Slide 2/18

**Re-Figuration of Spaces (CRC 2018-2022 -> 2030)**  
 Processive and often conflict-related transformation of spatial arrangements and interdependencies since the late 1960s

**Hypothesis on characteristics of Re-Figuration**

- Polycontexturalisation
  - Multiple references of communication and spatial action
- Translocalisation
  - Interconnecting and coupling of locations, embedding of different locations
- Mediatisation
  - New forms of media communication











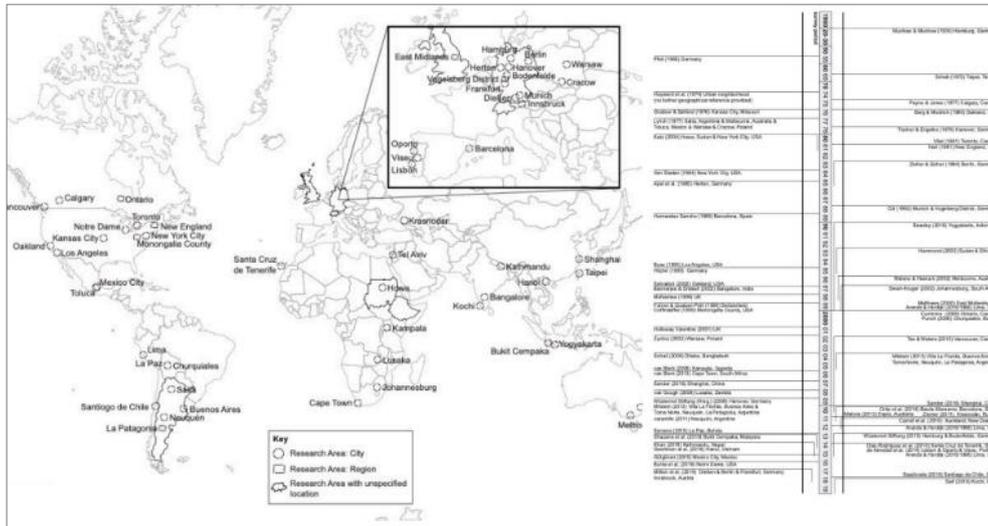


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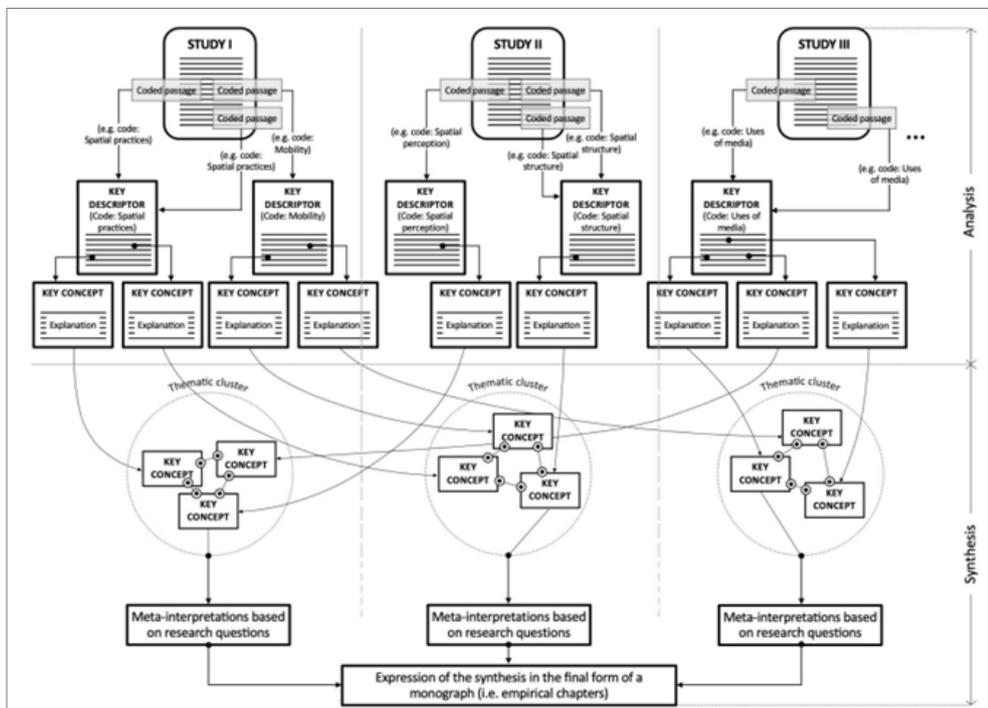
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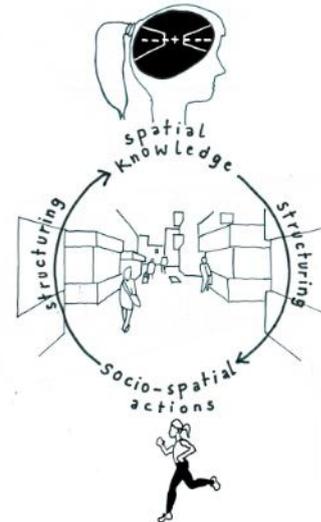
Slide 6/18

### Spatial knowledge – how do we conceptualize it?

Spatial knowledge as:

- The (socialized) subjective experience and perception of space;
- Spatial imaginations and;
- Emotions and affects associated with spaces.

Spatial knowledge is structuring *individual actions* and is objectified in several ways: embodied, materialized, spoken...

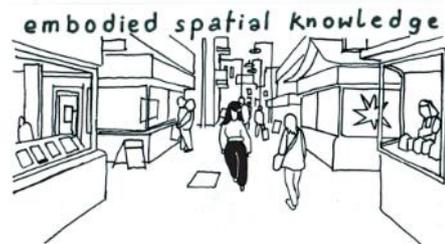


Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts

Slide 7/18

### Findings in perception of space

- Negative perceptions are very much fuelled by emissions with not much changes since the 1970s
- Global north: a lack of maintenance, care and upkeep of buildings, public street spaces, playgrounds, and parks & anti-social behavior – not much contrast and variations in findings
- In certain contexts, negative aspects alter young people’s perceptions of formerly labelled safe spaces like homes, schools, parks, and playgrounds



- Commonly: motorized traffic perceived as being dangerously competitive

Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts

Slide 8/18

**embodied spatial knowledge**

- negative spatial perceptions are influencing especially the perception of insecurity, which are also propelled by narratives of adults and the media → feelings of insecurity
- due strategies of reducing contact with the everyday outside and 'adult world' by staying at home, off the street and in 'tamed' spaces like malls, young people have less embodied experiences within neighbourhood spaces



Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts

GRI KOSKI - VISUALIZOIDE

Slide 9/18

**LESS or Overlaid embodied spatial knowledge**

**MORE mediated spatial Knowledge**



encompasses all those stocks that are gained through any means other than direct sensory and embodied experience and action: narrations from adults, print media, school education + TV, video films, radio, social media, playing video games...

Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts

GRI KOSKI - VISUALIZOIDE

Slide 10/18

**mediated spatial Knowledge**

- increased home-based activities and an increased use of computer-based amusement & communication (McNamee 1998; Holloway und Valentine 2001; Malone und Hasluck 2002; Ziemer 2011; de Almeida u. a. 2014; Díaz-Rodríguez u. a. 2015; Carroll u. a. 2015; Sander 2016)
- it effects also how affordances of physical spaces are judged: adds affordances to spaces

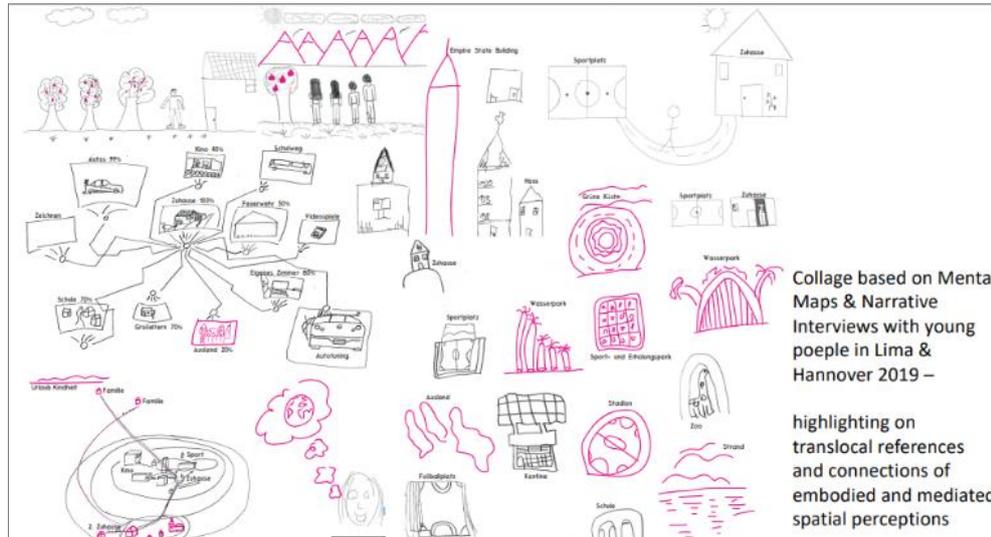
**Examples:**

- home for socializing practices or for play, less knowledge of physical immediate surrounding (Malone/Hasluck 2002)
- young people with extensive smartphone use lack attention towards the direct physical and social environment, but enjoy a new and positively seen sense of privacy in public space they value positively (Hatuka and Toch 2016)
- adventures spaces are virtual space (Carroll u.a. 2015)

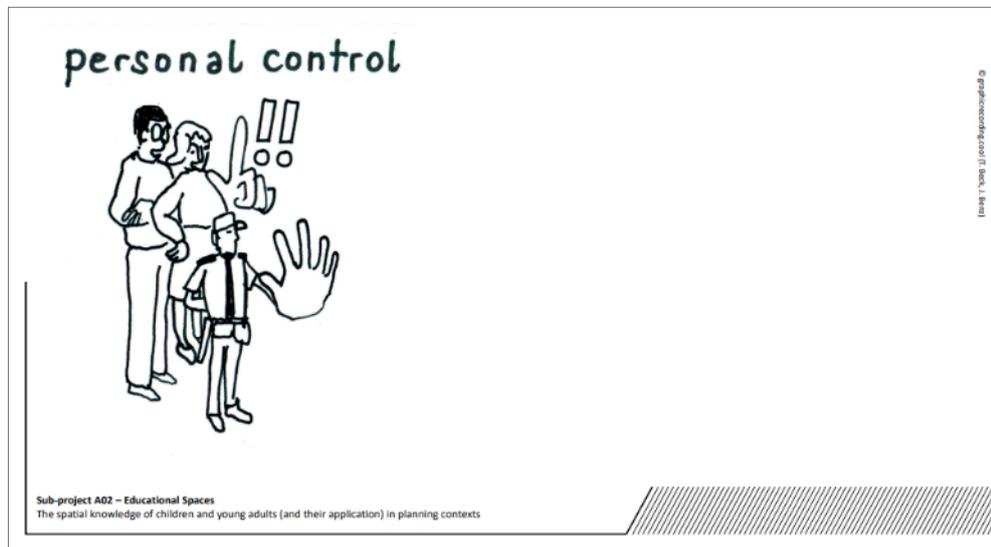


Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts

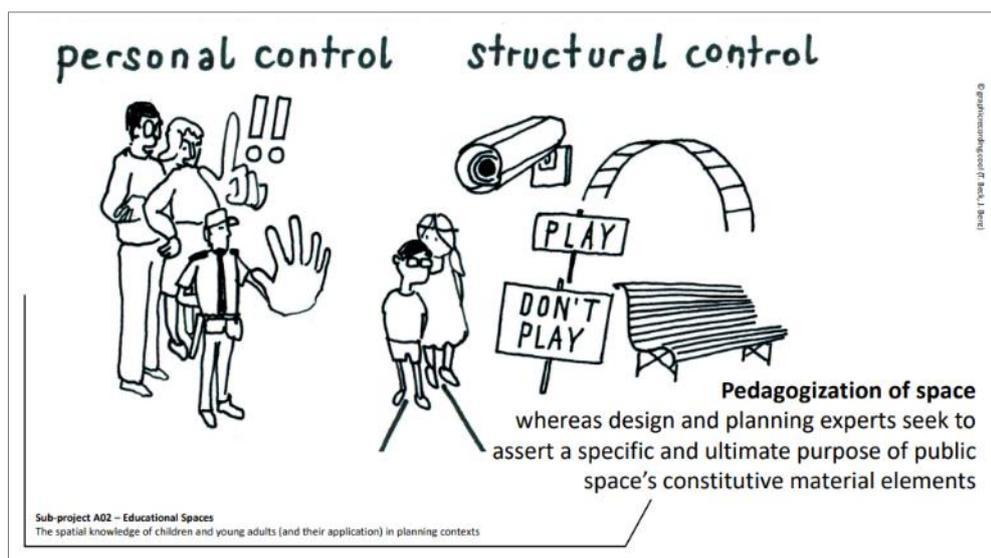
Slide 11/18



Slide 12/18



Slide 13/18



Slide 14/18



### Consequences for spatial planning and spatial design

The stable gender differences in young people's spatial practices, perceptions of space and activity spaces, highlight the urgent need for planners and designers to **be highly sensitive to gender issues** and to incorporate them into their actions.

Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts

personal control      structural control



Slide 15/18

### Consequences for spatial planning and spatial design

In order to allow for more independent unsupervised activities in outdoor spaces for young people, planners and designer should aim to **create spaces that give people a sense of security**.

Spatial pedagogisation can have various negative consequences for young people and especially their self-determined spatial practices. There is a need to **introduce the topic of spatial pedagogisation into professional debates** in planning practice.

Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts



Slide 16/18

### Consequences for spatial planning and spatial design

As young people are growing up in an increasingly interconnected world also **problem solving actions of planning policy and practice are being connected**. There is a rising necessity to trace and find **connections between very different settings as a base and inspiration for spatial change** across scale and space taking into account young people's divers spatial knowledge stocks and their navigating, comparing and coupling abilities.

Sub-project A02 – Educational Spaces  
The spatial knowledge of children and young adults (and their application) in planning contexts



1970                      today

→ increasing complexity  
fast mediatization

Slide 17/18

## Upcoming

**Publication:** The Evolving Spatial Knowledge of Children and Young People, Routledge 2022

**Follow up research:**

- (1) The constitution of online, offline and hybrid spaces by young people
- (2) Exploring and Designing Urban Density. Neurourbanism as a Novel Approach in Global Mental Health, Berlin University Alliance's Grand Challenge Initiative „Determinants of Global Health: Exploring Biological, Human-made & Environmental Factors“



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Projektleitung

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Post-doc Förderphase I & II

**Jona Schwerer**  
TU Berlin, FG Städtebau  
Doktorand Förderphase I



Slide 18/18

## Annex 2

### EMOTIONAL CITIES

# QUANDO AS CIDADES NOS TRAZEM EMOÇÕES À FLOR DA PELE, O QUE DIZ O NOSSO CÉREBRO?

Durante os próximos quatro anos, o projecto europeu *eMOTIONAL Cities* dispõe de cinco milhões de euros para tentar perceber como o ambiente urbano afecta a saúde mental das pessoas, em particular aquelas que sofrem de defeito cognitivo ligeiro. Mais do que encontrar uma terapêutica para estes pacientes, a iniciativa, que conta com coordenação portuguesa, tem como objectivo tornar o planeamento urbano preventivo nesta matéria.

#### FILIPA CARDOSO

Para a maioria dos que habitam em centros urbanos, viver a cidade tornou-se algo tão banal que a enorme quantidade de informação recolhida pelos sentidos nessa experiência quotidiana já passa despercebida, assim como a relação que esta tem com as emoções. As emoções, por sua vez, são mais difíceis de ignorar; influenciam o nosso bem-estar e as decisões que tomamos. Vários estudos mostram que a cidade pode influenciar aquilo que sentimos e a forma como nos comportamos. Mas como e em que medida podemos, por exemplo, usar isso a nosso favor e planear cidades que sejam mais benéficas para a nossa saúde? A resposta a esta questão poderá estar naquilo que é a proposta do projecto *eMOTIONAL Cities*. A iniciativa, que arrancou em Março, pretende “fornecer evidência científica sobre como o ambiente natural e urbanizado molda o processamento emocional e cognitivo do ser humano, incorporando elementos como idade, género e grupos vulneráveis”, e, a partir daí, desenvolver políticas de saúde urbana. Nesta busca por evidência científica que una o urbanismo e o ambiente construído e natural à nossa saúde mental, o projecto foca-se num público-alvo específico: idosos com defeito cognitivo ligeiro, isto é, pessoas num estado pré-demência, mas ainda funcionais nas actividades do dia-a-dia e para a realização das experiências. A escolha deste grupo deveu-se ao facto de a demência ser uma doença com repercussões marcantes e com prevalência numa população envelhecida. Sendo o envelhecimento da população um dos principais desafios actuais das cidades, encontrar formas de tornar o ambiente construído mais inclusivo, em particular para os mais idosos, mostra-se ainda mais pertinente. Elaborar recomendações nessa matéria será um dos objectivos da iniciativa internacional, mas não é o único, estando também prevista a criação de uma infraestrutura que

integre dados diversos, quer sejam de base geográfica, quer sejam biológicos ou outros, e que possa potenciar experiências semelhantes futuras.

Para o fazer, o projecto conta com cinco milhões de euros de financiamento do programa *Horizonte 2020* e assume dimensão internacional, sendo co-coordenado por duas entidades portuguesas: o Instituto de Geografia e Ordenamento do Território (IGOT) e a Faculdade de Medicina (FMUL), ambos da Universidade de Lisboa. Doze parceiros internacionais compõem o consórcio do *eMOTIONAL Cities*, sendo que as suas áreas de conhecimento se dividem pelas duas áreas do projecto – Urbanismo e Neurociência – nas dimensões de Investigação e Inovação. Em matéria de Urbanismo, para além do IGOT, participam no projecto a Universidade de Cambridge (CAMB), a Universidade Técnica da Dinamarca (DTU), a Universidade de Tecnologia de Tallin (Taltech) e a Universidade do Estado do Michigan (MSU), que disponibiliza também competências na área da Neurociência, a par da FMUL e da Universidade de Tartu (UTARTU). Para assegurar a parte da inovação, o consórcio inclui cinco empresas com *expertise* em análise climática (Climateflux), observação do planeta e *Big Data* (a portuguesa EarthPulse), biossensores e integração (NeuroGears Ltd) e realização de electroencefalogramas e análises de dados (Starlab Barcelona SL). Por fim, a comunicação e divulgação da iniciativa está a cargo da quarta entidade nacional no projecto – a Sociedade Portuguesa de Inovação (SPI).

#### EXPERIMENTAR CENÁRIOS, TESTAR EMOÇÕES

Com duração até Fevereiro de 2025, o passado mês de Março marcou o arranque oficial do *eMOTIONAL Cities*, no entanto, já há algum tempo que o projecto estava a ser desenvolvido. No IGOT, Paulo Morgado é o investigador responsável pelo projecto e foi dele que partiu a ideia. À inspiração trazida pelos livros de



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António Damásio e Jane Jacobs sobre como as cidades afectam a saúde das pessoas, juntou-se a curiosidade de explorar mais o tema, em particular, na sua relação com a saúde mental, sobre a qual “havia bibliografia, mas muito teórica”, conta. Apercebendo-se dessa “falta de evidência científica”, a investigação de Paulo Morgado levou-o à Neurociência, mais concretamente, ao encontro de Bruno Miranda. Com a ajuda do investigador da FMUL e também médico neurologista, a ideia ganhou “racionalismo científico” para perceber o que era necessário para “fazer com que o cérebro desse uma leitura de que, realmente, o espaço urbano consegue espoletar em nós determinado tipo de emoções, e como [seria possível] descodificar e medir esses sinais”.

Com a candidatura ao *Horizonte 2020* aprovada, os trabalhos do eMOTIONAL Cities estão já em andamento, estando previstas experiências de rua (exteriores) e em laboratório (interiores) em quatro cidades que servirão de casos de estudo ao projecto – Lisboa, Copenhaga, Londres e Lansing (EUA). “Começamos por fazer uma análise espacial de aspectos de urbanis-

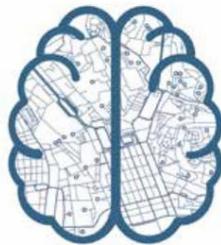
mo, usando uma metodologia mista, quer qualitativa, quer quantitativa”, explica Bruno Miranda, que, com Paulo Morgado, assume a coordenação do projecto. Nesse trabalho inicial, inclui-se a avaliação de políticas de saúde urbana destas cidades, mas também a análise de sentimento com base nas redes sociais – isto é, recolher *tweets* da população em geral que têm informação geográfica e usar conversores de texto para componente emocional, de forma a fazer um mapeamento das emoções partilhadas.

Sendo que existem já experiências semelhantes e o objectivo da iniciativa é inovação, a equipa do eMOTIONAL Cities quer ir mais além nesta matéria: “Temos um conjunto de métodos e de tecnologia que vai permitir ir além do conhecimento científico que existe nesta área. Combinamos informação proveniente de *social media*, mas também dados dos Censos – por exemplo, para categorizar o território e saber se há determinado tipo de emoções que são espoletadas em determinado tipo de território e, assim, classificá-lo através de métodos de análise de *clustering* – e vamos ter também informação mais biológica proveniente de biossensores”, adianta Paulo Morgado.

Para ter acesso a este tipo de informação, o projecto contempla uma série de experiências feitas quer no exterior, quer em laboratório, que, através de dispositivos tecnológicos, entre os quais capacetes de electroencefalogramas (EEG) portáteis, lhes permitirá perceber onde e quando é que estas emoções acontecem no cérebro. “Nas experiências, queremos algo que vá ao encontro da parte emocional, mas também da parte de tomada de decisão e do comportamento social”, refere Bruno Miranda.

De forma a assegurar a robustez do ponto de vista científico e definir quais os dados a recolher, as experiências irão, primeiro, fazer-se em laboratório, já a partir de Janeiro. Os testes terão base em realidade virtual e recorrendo a ressonância magnética funcional, “para localizar onde estas coisas acontecem no cérebro”, e a EEG, “que podem dar mais informações sobre quando é que essas coisas estão a acontecer”, avança o especialista. Os voluntários vão percorrer esta área num cenário virtual, “caminhando numa passadeira como se estivessem a andar na rua”. A modelação vai permitir à equipa do projecto simular diversos elementos, como as cores das fachadas, e, daí, retirar os dados comportamentais e cerebrais do participante. As experiências serão repetidas na rua, durante os períodos de verão dos dois próximos anos.

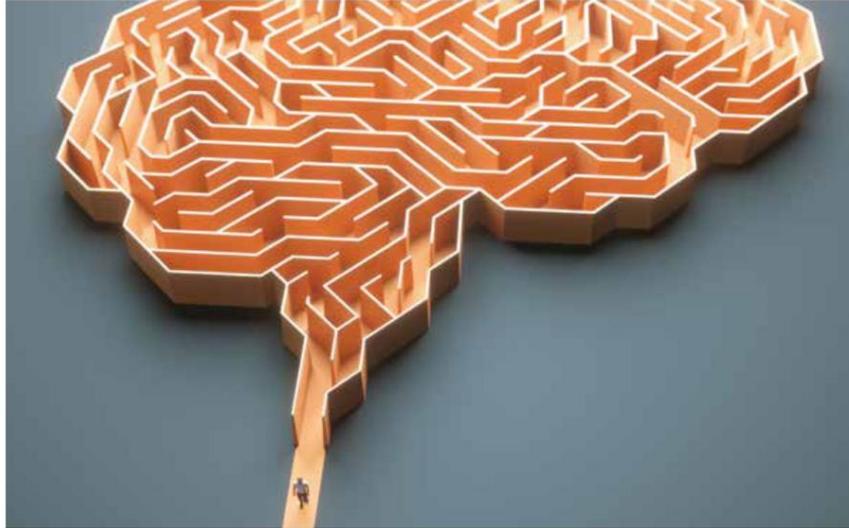
Nas várias cidades, pretende-se que haja entre quatro a cinco zonas em estudo “representativas de alguns aspectos [particulares], como dispor de uma área de lazer ou de um espaço verde, ou ser uma zona mais tradicional ou com determinada dimensão urbanística”.



eMOTIONAL  
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#### LISBOA RECEBE CONFERÊNCIA INTERNACIONAL EM NOVEMBRO

Com quatro anos de trabalho pela frente, até ao final de 2021, os investigadores estarão ocupados com a integração e sincronização de dados, com a preparação da componente de realidade virtual e com os protocolos que definem o que vai acontecer nas experiências. Para além disso, os coordenadores do projecto estão neste momento a preparar a primeira de quatro conferências internacionais no âmbito do eMOTIONAL Cities, e que terá lugar em Lisboa, nos dias 22 e 23 de Novembro. O evento contará com a participação de elementos do consórcio e também da especialista internacional Angela Million, directora do departamento de Planeamento Urbano e Regional da Universidade Técnica de Berlim.



Em conta é preciso também ter factores que possam interferir com o funcionamento dos equipamentos, como a proximidade de uma central electromagnética, e aproveitar a existência de trabalho feito que possa ser útil ao projecto – por exemplo, zonas já modeladas em 3D. No caso de Lisboa, este último factor determinou já a primeira localização do projecto: a rua das Escolas Gerais. Os investigadores não estão ainda certos sobre quantas pessoas (voluntários) irão participar na experiência, mas o número deverá estar entre os 20 e 30 participantes. “A ideia é as pessoas caminharem, usando dispositivos [capacetes], a partir dos quais fazemos a monitorização cardíaca e respiratória e um EEG, mais portátil, com menos canais eléctricos; ao mesmo tempo, os participantes levam também uma mochila com sensores de exterior”, explica Bruno Miranda.

Também integrada no projecto está uma outra experiência ligada à área da mobilidade, a realizar em Lis-

boa e em Copenhaga, e que tem como ponto de partida a experiência do parceiro dinamarquês do consórcio: através de uma aplicação, as pessoas serão interpeladas em certos momentos para fazer uma avaliação da localização em que se encontram, ao mesmo tempo que usam um relógio biométrico a partir do qual será possível recolher dados biológicos. “Estamos a falar, neste caso, de 100 pessoas em cada uma das cidades, o que nos vai conseguir dar dados interessantes”, adianta.

Feitas estas experiências, em 2023, o projecto regressa ao modelo virtual e avança para a experiência clínica, na qual vai trabalhar com aquela que é a sua população-alvo. “Os doentes com defeito cognitivo ligeiro demonstram ter problemas de orientação espacial e a nossa hipótese é: tendo adquirido conhecimento com as experiências anteriores, será que conseguimos modelar determinada rua de forma a encontrar a melhor disposição da cidade para que estas pessoas naveguem melhor?”, esclarece o investigador da FMUL. O plano é fazer duas experiências, uma pré e outra pós modificação, e observar se o comportamento destes doentes se altera. “Se conseguirmos mostrar que sim, estamos a mostrar que conseguimos ter uma componente terapêutica ao desenhar cidades que tenham em conta determinados aspectos”, aponta Bruno Miranda. Por sua vez, Paulo Morgado sublinha o potencial que isto pode trazer para os decisores – “ao introduzirem este tipo de conhecimento nos seus instrumentos de planeamento, as cidades futuras podem acautelar potenciais mecanismos que tenham impacto na saúde mental das pessoas e, nesse caso, já não será tanto terapêutico, mas profilático”, acrescenta. **sc**

#### PANDEMIA REFORÇOU TEMA DO PROJECTO

Durante os períodos de confinamento, impostos pela pandemia, os temas da saúde mental e da necessidade de contacto com o exterior tornaram-se “ainda mais relevantes”, confirma Bruno Miranda. O *eMOTIONAL Cities* foi pensado antes da pandemia e, embora a chegada da Covid-19 e os seus impactos não tenham alterado a essência do projecto, a verdade é que os temas se tocam e, por isso, acabou por haver uma adaptação de uma parte do trabalho. “Um dos nossos parceiros, que é responsável pela mobilidade, propôs analisar como foi a actividade ao longo do confinamento, em que zonas as pessoas saíram, como foram socialmente classificadas, se traziam determinadas emoções e se foram essas que as pessoas evitaram”, explica o médico.

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