

Methodological design and application of NVIVO for a perceptual analysis of green infrastructure in the periphery of Madrid.

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Abstract. The complexity of the study of landscape and urban green infrastructure, and the perceptual aspects required to characterize them, calls for a qualitative analysis. Together with a series of case studies details and nuances arise when analyzing what the literature has called the "non-expert" view of the landscape. The study of urban green infrastructure, specifically its perception, is carried out using a qualitative methodology, with an analysis based on NVIVO software. We coded a series of semi-structured interviews conducted in metropolitan parks on the city-center fringe. The coding process, although not linear, is increasingly selective and specific, starting with an open coding (general, of all the interviews), followed by an axial coding, and finishing with a selective coding, so that a correlation is created between the most referenced concepts throughout the interviews (called "nodes"). The main objective of the proposed methodological analysis is to shed light on the perception of the elements that are part of the green infrastructure network of the Madrid metropolitan area. The following nomenclature was used to refer to de views on the landscape: "technical" (or trained) and "everyday" (or day-to-day) to refer to the views of the landscape. In the light of the results obtained from the qualitative analysis of the interviews, we can see how a relatively small sample can yield significant conclusions regarding both the methodology itself and issues intrinsically linked to landscape such as place attachment, sense of belonging, relationship with the surroundings or image of the city. Results were also obtained in relation to the urban green infrastructure itself, such as levels and relevance of connectivity, multifunctionality and accessibility.

Keywords: landscape perception; urban green infrastructure; Madrid; NVIVO; Qualitative Research.

1 Perception and subjectivity in the study of landscape

The concept of "landscape" has always been linked to the cultural and perceptive aspects that affect human beings and influence their way of perceiving the environment (Maderuelo, 2005; Mata Olmo, 2008). The subjectivity of the perceptual factor adds complexity to the scientific and systematic study of it, which must unfailingly be based on qualitative matters and cannot be limited to quantitative analyses only. Therefore, in this research we propose a qualitative analysis for the study of perception in case

studies, which allows us to delve into the details and nuances of what the literature has named the "non-expert" view of the landscape (Zube et al., 1982; Larrère & Larrère, 2009). To this end, the use of NVIVO software is explored as a supporting tool, making use of a "technical view" to understand the "everyday view" of people experiencing a place (Santo-Tomás Muro et al., 2021).

The term "landscape" has evolved throughout history, integrating aspects of different disciplines, which have given "landscape" the holistic character it has today. Perception plays a fundamental role in the assessment of the landscape. It depends both on the elements of the physical world and on the relationship with other people and subjective individual experience, combining social and cultural factors that lead to the identity of a place (Greenbie, 1982). Although natural and rural spaces have been extensively studied in recent years, the perception and assessment of complex urban environments has been less explored throughout history.

From the 18th century onwards, a greater sensitivity towards the way we perceive and relate to the environment that surrounds us emerged. The recovery of the *Genius Loci* by Alexander Pope, as well as the "sense of place", referring to the relationship between people and the environment, by romantic artists (De Certau, 1980; Augé, 2003), appeared in the landscape designs of the time. However, it was not until the second half of the 20th century that the subjective attributes of landscape began to be systematically studied. To this end, landscape valuation tools were created that led to legislation for the protection of spaces for their aesthetic value and visual impact, such as "scenic roads" and the protection of coastal areas, especially in the United Kingdom and the United States of America.

As a result, the concept of "Psychogeography" was coined, connected to what is known as "environmental psychology" (Hellpach, 1935; Hernández Ruiz and Jiménez Burillo, 1988). The relationship between the city and its residents was also studied from a perceptual perspective (Kevin Lynch, 1960; Gordon Cullen, 1961), defining the basis of the "Theory of Place", which states that urban planning must have emotional interpretations and meanings associated with it in order to show its identity, and thus gain the true status of place (Cruz Pérez and Español-Echániz, 2009).

The lack of a theoretical and methodological basis encompassing the different points of view when studying landscape led to the definition of the main paradigms of landscape perception (Zube et al., 1982), based on the relationship between humans and nature: the "expert observer paradigm" where the observer is trained and has notions of art, design or ecology (Burke, 1975; Duffield and Coppock, 1975), the "psychophysical paradigm", where it is defended that perception depends on a series of external stimuli that the observer perceives without being conscious (Clamp, 1976; Crystal and Brush, 1978), the "cognitive paradigm", which seeks to understand the meaning associated with the landscape as a function of experiences, memories, expectations and socio-cultural conditions (Price, 1979; Riley, 1979) and the "experiential paradigm", where it is considered that the values associated with the landscape are based on the interaction with it, in an active process (Lowenthal, 1968; Duncan, 1973).

Where the first two paradigms relate to the specific context of place, and share a practical focus, the latter two attempt to understand the anthropic context, and therefore have a wider application in perceptual-landscape studies, focusing on meaning and

interaction with the environment. Today, there is a growing demand for a systematic study of the experiential and cognitive paradigm, reflecting a direct relationship between spaces and the practice of place.

In the sense of aesthetic valuation, Lothian defines the "objective" and the "subjective" approaches, closely linked to what has also been called "expert analysis" and "non-expert analysis". Accordingly, the first (generally associated with the "expert analysis") is based on the "immutable elements on which it is possible to make an absolute judgment, regardless of time and place" (Lothian, 1999; Pardo-García and Mérida-Rodríguez, 2017), while the subjective approach defends the idea that the very aesthetic sense of the place depends on the interaction between landscape and the observer (Kaplan and Kaplan, 1989; Nogué, 2015; Tafalla, 2015). Therefore, the first paradigm defends the inherent elements in the physical landscape, whereas the second one strongly depends on the observer's mindset.

In recent years, one of the methods that best combines the elements that constitute the landscape in its most holistic sense is the so-called Landscape Character Assessment (Tudor, 2014). This method brings together the natural, cultural, social, perceptual, and aesthetic aspects that define a given landscape. Throughout this research, a qualitative methodology based on NVIVO software will be used to underpin the study of landscape perception.

2 Objectives, methodology and research stages

Due to the complexity of the study of landscape perception, we propose a series of methodological tools to address it. This methodology is part of a broader proposal of perceptual analysis tools, developed in the PhD dissertation of the first author (Santo-Tomás Muro, 2021), which focuses on the study of urban green infrastructure in the outskirts of the city of Madrid.

Therefore, the objective of the research is the perceptual study of the landscape, particularly in its most subjective facets. This leads to two research questions, one mainly methodological and the other specific to the subject of study, the perception of the landscape: Is NVIVO a suitable software for the study of the perception of the landscape? And, based on its implementation in the case studies, what are the elements or issues that most affect the perception of the landscape? The results and conclusions sections will be related to these two facets of the research.

In order to undertake the study, and to narrow down the scope of the research, we decided to focus the study on the city of Madrid, one of the European capitals with the highest population density in its metropolitan and peri-urban area, and more specifically on the large metropolitan parks around the city: *Parque Lineal del Manzanares, Madrid Río, Dehesa de la Villa, Parque Forestal de Valdebebas, Parque Juan Carlos I and Cuña Verde de Moratalaz* (Fig.1). The selection criteria is based on the main characteristics of urban green infrastructure: connectivity, multifunctionality and accessibility (Mell, 2010). In addition, they present features that enable their morphological, character, scale and city-countryside relationship comparison. Every case study also

contains a viewpoint from which the city as a whole can be seen. As these spaces are close to residential environments, they are part of the everyday life of the interviewees.



Fig. 1. Case studies location and selection. Santo-Tomás Muro, R (2021).

For each case study, we use both cartographic and qualitative tools to analyze the data set obtained in the fieldwork. The use of qualitative analysis for the study of the perception of the case studies allows a deeper analysis of the details, documenting the "non-expert" view. These qualitative methods, widely used in social science studies, are of great use in urban research, as they allow us to understand different perspectives of the same place, distancing us from grand generalizations or "absolute truths" (Flick, 2004).

We study these spaces at a local scale, analyzing the people's experienced and the relationships generated with the city itself, where visual component plays a fundamental role. The study is divided into two stages: first, field work, documenting the environment and conducting semi-structured interviews in the field of study; and a second stage, consisting of the analysis of the results using NVIVO software, and discussing them in relation to theoretical concepts from the literature. Written documents (transcription of the interviews) are combined with image analysis (drawings of the interviewees).

2.1 Fieldwork design and analysis tools

The first phase of the fieldwork (i.e., observation of the environment and documentation), leads to a pre-characterization under the filter of what we call an "expert view". The second phase (i.e., interviews with people in the studied setting), reflects the "non-expert view". The analysis with NVIVO of the data collected in the fieldwork, enables an evaluation of the perception combining both points of view.

Each case study is visited twice: once on weekdays and once on weekends. For each visit, we walk through the study area, taking note of the environmental conditions and first impressions of the surroundings, as well as photographing and documenting the condition of the site. Once this is completed, we conduct the interviews.

The study of the "non-expert view" is based on a series of semi-structured interviews combined with drawings made by the interviewees themselves, *in situ*. For the "semi-structured interviews", we use a script, presented in a worksheet, with open questions and proposed topics (Fig.2). We prioritize capturing the interviewees' opinions and therefore develop the interview as they consider best, allowing for the addition of other questions during the conversation and for new topics of interest to arise from the conversation. This provides a certain flexibility, with concepts that emerge directly linked the interviewees' experience of the place, as they are not just filling in a questionnaire of closed questions.

CASE STUDY: _____	Number of people interviewed: <input style="width: 50px;" type="text"/>
INTERVIEW DURATION <input style="width: 40px;" type="text"/> <input style="width: 40px;" type="text"/> <input style="width: 40px;" type="text"/> <input style="width: 40px;" type="text"/> T: <input style="width: 40px;" type="text"/>	
Place of residence: _____	How do you feel when you are here? <input style="width: 100%; height: 30px;" type="text"/>
Age group: <input type="checkbox"/> 0-18 <input type="checkbox"/> 19-30 <input type="checkbox"/> 31-50 <input type="checkbox"/> 51-65 <input type="checkbox"/> >65	Do you have any anecdotes related to this place? <input style="width: 100%; height: 30px;" type="text"/>
Frequency of visits to the site: <input type="checkbox"/> 1 / week <input type="checkbox"/> several / week <input type="checkbox"/> 1 / month <input type="checkbox"/> several / month <input type="checkbox"/> 1 / year <input type="checkbox"/> several / year <input type="checkbox"/> First time visiting the site	In your opinion, what does (the park) bring to the neighborhood? <input style="width: 100%; height: 30px;" type="text"/>
Reasons for visiting the site / Activities: <input style="width: 100%; height: 30px;" type="text"/>	Other <input style="width: 100%; height: 30px;" type="text"/>
Are you usually accompanied?, By whom?: _____	
Positive elements: <input style="width: 100%; height: 30px;" type="text"/>	Degree of maintenance <input type="checkbox"/> n/a <input type="checkbox"/> low <input type="checkbox"/> average <input type="checkbox"/> high
Negative elements, What would you improve?: <input style="width: 100%; height: 30px;" type="text"/>	Degree of security <input type="checkbox"/> n/a <input type="checkbox"/> low <input type="checkbox"/> average <input type="checkbox"/> high
	Accessibility <input type="checkbox"/> foot <input type="checkbox"/> car <input type="checkbox"/> bike <input type="checkbox"/> public transport _____
Scenic View Assessment: <input type="checkbox"/> n/a <input type="checkbox"/> very low <input type="checkbox"/> low <input type="checkbox"/> average <input type="checkbox"/> high <input type="checkbox"/> very high <input type="checkbox"/> not interested	

In this way, if issues not raised in the original worksheet were repeated, they were eventually added to the questions in the following fieldwork trips. The use of a similar structure for the conversations allows for later comparison between cases and individuals, but at the same time allows for the possibility of discussing different concepts or ideas with the participants.

Interviews last 10 minutes on average, although it depends on each interviewee, as there was no time limit. They are conducted both individually and in groups, allowing us to evaluate the experience both individually and collectively, especially on weekends, when there are many families strolling through these spaces.

During the "theoretical sampling" (Hernández Carrera, 2014), that is, the data collection, the interviewees are selected randomly, approached directly in the case studies (viewpoint areas) between 10:30 and 12:30 am, on days with good visibility and no risk of rain. An average of five interviews were conducted per case per day. For the selection of the participants, we prioritized the greatest variety of profiles, mainly according to age.

In this time span and with this number of interviews (61), we reach the representativeness of the sample, reaching a "theoretical saturation" that marks end the sampling. Reaching this 'saturation' means that the data obtained allow us to develop the objectives of the research, without the need for new interviews, as new concepts no longer arise, and responses begin to repeat themselves (Mason, 2002; Valles, 2002; Hernández Carrera, 2014).

Some of the questions asked, not counting those added during each conversation, are: naming positive and negative elements of the environment, describing how they feel about the place, telling anecdotes related to the park, detailing what the park brings to the neighborhood (depending on whether or not they live in an adjacent neighborhood), rating maintenance and safety, and indicating how they access the environment and how often they visit it.

Finally, the interviewees are asked to draw a picture from the viewpoint where they are. Although this part sometimes caused an initial rejection for some of the interviewees, especially those in older age groups, once they begin to draw, they tend to be more participative. In the case of group interviews, the drawing is usually done by one of the participants, accepting comments from the others and including them in the drawing.

The graphic quality is not relevant when analyzing the answers; the fact that they draw certain elements reveals what they give more importance to, demonstrating an active attitude. If they were to take a photograph, only what is seen from the area would be shown, with no more subjective filter from each interviewee than the chosen framing.

2.2 Qualitative analysis. The NVIVO Software

The analysis of the information collected in the interviews and the drawings obtained from the fieldwork is mainly qualitative, in order to allow a better understanding of the subjectivity inherent in the perception of the landscape. It is carried out using *NVivo 12 Plus for Windows* software. The program is able to work with texts, audio files, video and images, through the coding of audiovisual material (Meneses, 2019). Despite being a useful tool for data storage and coding, the researcher is the analyst who interprets and codes the information, and not the program (Bergin, 2011).

Once the transcription of interviews and drawings are imported, we classify them according to attributes or properties: case study, sex, age group, perceived level of security, perceived level of maintenance, scenic valuation, frequency of visit, number of people interviewed, type of access, day of the week and duration of the interview.

The interpretation of the information collected from the interviews followed the ideas of "grounded theory", based on the analysis of qualitative data through an inductive process, to reach a theoretical formulation about the area (Glaser and Strauss, 1967; Hernández Carrera, 2014). Thus, the process of coding the files, that is, the assignment of a series of codes to the interviews and drawings, is mainly an inductive process, which is carried out after the fieldwork, although the knowledge generated by the literature review is also taken into account.

Coding is done by creating "nodes", i.e., categories of analysis; themes, concepts, ideas, or experiences that the researcher assigns based on the connections that emerge from the interview narratives. Although the nodes are defined as much as possible by the interviewees' responses, some of the nodes are inferred by the research interests (e.g., concepts such as identity, multifunctionality, accessibility and connectivity).

As these interviews and drawings are coded, new nodes are added that arise from their own analysis, so the process is not purely linear; for each node there is a "back and forth" process (Sabariego, 2018; Schettini & Cortazzo, 2015). In each file, words,

phrases or images are marked and one or more nodes are assigned according to their meaning and intentionality. The coding process is key for the subsequent analysis of the results, making sure that it is carried out by reducing as much as possible the pre-conceived ideas that researchers may have.

For the definition of the final nodes, we carry out a “decantation”, where we refine the concepts more and more until we arrive at the final nodes that are used to characterize the interviews (Fig. 3) (Flick, 2004). There are different types of data analysis for theoretical coding, including "open coding," "axial coding," and "selective coding" (Weil, 2017).

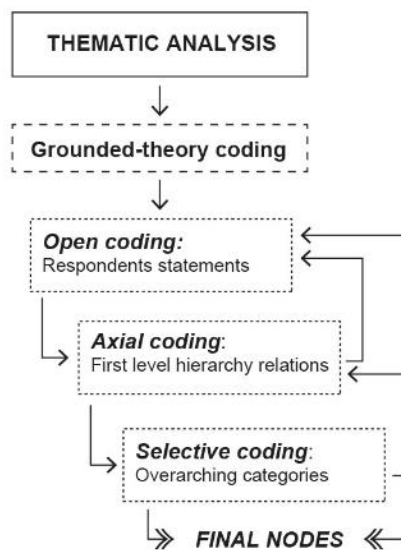


Fig. 3. Outline of the coding process. Santo-Tomás Muro, R (2021).

First, we conduct an "open coding" process, in which we identify sentences as categories that emerge directly from the interviews, with many references to the original interviews. From this first process, the most frequently mentioned themes can be extracted. “Axial coding” refers to a first filter on the basis of hierarchical relationships that have emerged from the "open coding", which involves a reorganization of the relationships between the first concepts. This generates categories and subcategories indicating the relationships between nodes are generated. “Selective coding” consists of highlighting a main category among the previously defined nodes, which are related to the concepts previously studied.

When new codes arise that were not included in the first classification, they are added directly from the file coding, which will also allow them to search for relationships or patterns between the different case study interviews.

For example, the coding of the sentence "This is like a mini lung for the neighborhood, despite having the road next to it" was first coded by defining two open nodes

"neighborhood lung" and "proximity to roads". They were then refined to general axial nodes "references to the neighborhood (benefits) and "transportation infrastructure". Finally, they were classified into a larger category (selective nodes): "Context" and "Grey infrastructure".

Hence, we define a series of nodes for the interviews, and others for the drawings made during the fieldwork (Fig. 4). These are independent categories, sometimes subdivided into descendant nodes, resulting in "node trees", hierarchical networks between nodes.

INTERVIEWS NODES	DRAWINGS NODES
<p>ACTIVITIES</p> <p>ANECDOTES</p> <p>UGI BENEFITS</p> <ul style="list-style-type: none"> - Economic factor: <i>Referece to nighborhood businesses, Maintenance, Housing prices</i> - Environmental factor: <i>Nature, Air Quality, Pollution, Biodiversity, Water features</i> - Social factor: <i>References to the community, Health (mental, physical, social), Social Networks, Social Justice</i> <p>CONTEXT</p> <ul style="list-style-type: none"> - References to the neighborhood: <i>Sense of place</i> - Historical references: <i>Anecdotes, Historical data</i> - References to other green spaces <p>DESIGN</p> <p>SENSORY ELEMENTS</p> <ul style="list-style-type: none"> - Auditory - Smell - Temperature - Visual: <i>Landmarks, Gray Infrastructure, City View</i> <p>UGI FACTORS</p> <ul style="list-style-type: none"> - Accessibility - Conectivity - Multifunctionality <p>SECURITY</p> <p>TIME</p> <ul style="list-style-type: none"> - Days of the week - Season - Hours of the day 	<p>CONTEXT</p> <ul style="list-style-type: none"> - Own neighborhood (own house drawing) - Adjacent neighborhoods - References to other UGI <p>ARCHITECTONIC ELEMENTS</p> <ul style="list-style-type: none"> - Cemetery - Historic buildings: <i>Cornice</i> - 20th century buildings: <i>CIEMAT, Plaza de España buildings, 12 de octubre building, IFEMA, Torre Picasso, Torres KIO, Torres-paña</i> - 21st century buildings: <i>Cuatro Torres Business Area, Wanda Metropolitano</i> - Unidentified buildings <p>DESIGN ELEMENTS</p> <ul style="list-style-type: none"> - Benches - Roads, paths - Landmaks of the park itself - Children's play areas - Exercise areas <p>ENVIRONMENTAL ELEMENTS</p> <ul style="list-style-type: none"> - Trees and low vegetation - Biodiversity (animals) - Sky, clouds - Pollution - River, water elements - Mountain range <p>GREY INFRASTRUCTURE</p> <ul style="list-style-type: none"> - Airports, Aircraft - Electical artifacts - Roads, cars - Cycle paths - Railway tracks, trains <p>PEOPLE</p>

Fig. 4. Nodes and subnodes. Santo-Tomás Muro, R (2021).

3 A selection of results from the case study analysis

In this section we present a small selection of results to illustrate the methodology described. The whole set of results for each case study can be found in the thesis of the first author (Santo-Tomás Muro, 2021), as part of a larger research project.

Once the files have been coded with the NVIVO software, we proceed to perform "queries", examine the relationships and number of references between files, attributes and nodes. Although there are different types of queries depending on the needs of the research, for this study we have opted for "matrix coding" queries, which allow us to visualize the distribution of categories among the different files, crossing data from files, attributes and nodes.

The visualization of these data appears either as a matrix (rows and columns) or as a graph (bar charts). The next figure (Fig. 5) shows the number of times the axial node (in this case "environmental elements") is mentioned.

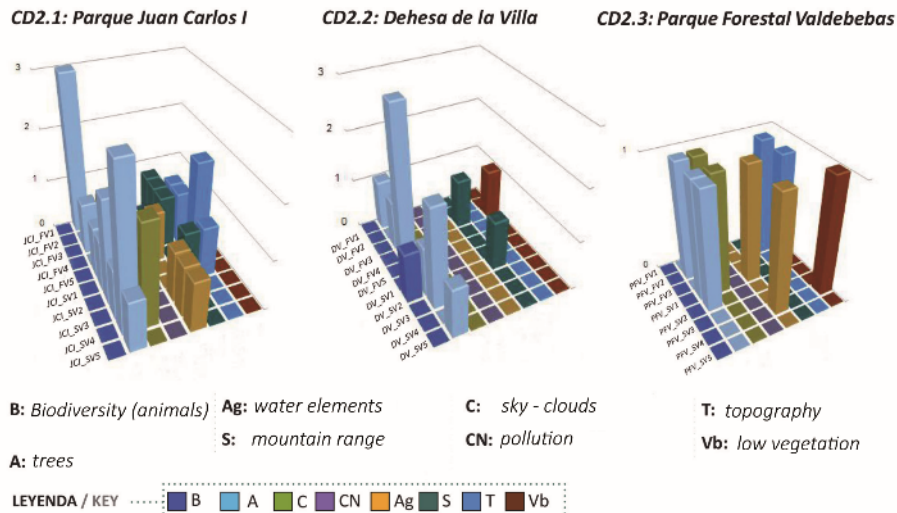


Fig. 5. Example of the "matrix coding" query "Environmental Factors", according to three case studies (left) and subnodes (colors). Santo-Tomás Muro, R (2021).

Generally, the elements most frequently referred to are plant elements (trees), especially in the case of *Juan Carlos I Park*. However, this difference is not always apparent, as in the case of the *Valdebebas Forest Park* we can find a similar number of references to trees, pollution, water features and low vegetation.

The other type of query used is the "hierarchy diagram" (Fig. 6), which displays the percentage ratio of the references in the interviews for each of the nodes, allowing an overview of the main themes and key issues in each case.

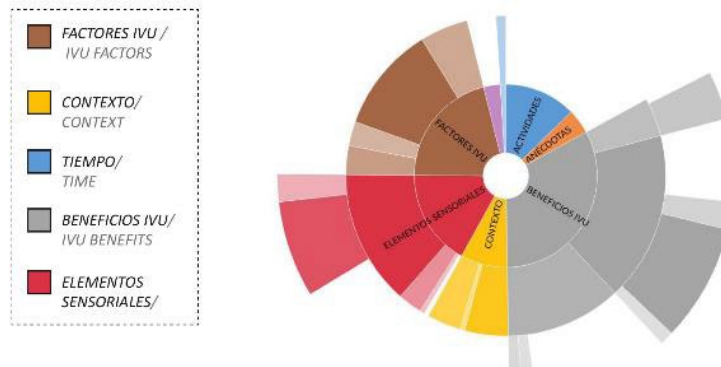


Fig. 6. Example of a hierarchy diagram. Case: *Juan Carlos I Park*. (Santo-Tomás Muro, 2021).

In the figure of *Juan Carlos I Park* there is a proportion of references quite similar to the rest of the cases, where the most commented nodes are the 'Benefits of Green Infrastructure' (especially environmental factors), followed by 'Green Infrastructure Factors' and 'Sensory Elements'. 'Context' is the next most mentioned topic. In this particular case, there are also numerous references to the design of the park itself, which reinforces the park's identity factor.

The proposed methodological analysis aims to understand the perception of the elements comprising the green infrastructure network of the Madrid area, but it is flexible enough to be applied to other case studies. This leads to some methodological reflections, both regarding the use of the software and general reflections on the perception of the landscape, as already mentioned when presenting the research questions.

4 Discussion

The implementation of this methodology has led to two types of findings: methodological (concerning the role of NVIVO software as a support tool in qualitative research), and specific to the subject of the study (the perception of urban green infrastructure in the contour of the city).

4.1 Methodological insights. Qualitative research assisted by NVIVO software (Computer Supported Qualitative Research).

A total of 61 interviews were conducted, half of which took place during the weekend and the other half during weekdays (Monday-to-Friday). The profiles of the interviewees varied according to the case study and the day of the week. The most frequent group of interviewees is between the ages of 31-50, followed by those aged 51-65.

In general, interviews on weekdays tend to be one-on-one interviews, mostly with people walking their pets, while on weekends they were usually in groups. The proportion of men and women interviewed was similar (around 32% in both cases). The remaining 36% corresponds to mixed group interviews. On weekdays, and with people over 65, the duration of the interviews was longer.

For the coding and analysis of the data, the NVIVO software proved to be a very valuable tool, allowing not only the storage of the transcriptions, but also the visualization and cross-referencing of the data. The researcher is the analyst who interprets the information and, therefore, the possibility of constantly reviewing the coding has been crucial when interpreting the results.

On average, we coded 33 nodes per interview. The process of open, axial and selective coding has resulted in increasingly more analysis-oriented categories. This process of "decantation" of the elements referenced during the interviews has allowed hierarchical relationships to emerge. The most coded nodes throughout the interviews were the "benefits of green infrastructures", the "sensory elements", and the "factors" that determine the quality of a green infrastructure, such as connectivity, multifunctionality or accessibility.

Age turned out to be one of the factors that had the most impact on coding. For example, respondents over 65 years of age were generally more reluctant to draw. However, they show a greater attachment to the place, making more references to contextual elements, as they have lived, for the most part, in the area longer. In contrast, respondents under 30, in general, hardly mention the context (Fig. 7).

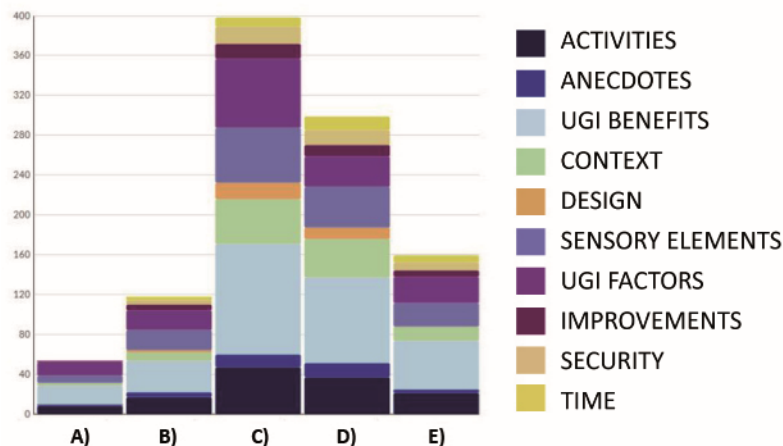


Fig. 7. Nodes coded according to age group: A) <18 B) 19-30 C) 31-50 D) 51-65 E) >65. UGI: Urban Green Infrastructure. Santo-Tomás Muro, R (2021).

Conducting the interviews in situ has made it possible to experience the place itself, so that the interviewees don't have to picture it. In addition, the selection of participants is considerably easier; they do not have to move to carry out the study.

Another important benefit of using these methods is that they involve few time and material resources, making their implementation quite economical. The results obtained show that these interview techniques provide significant results with a relatively small sample of interviews. This represents an advantage, as it can be used in a flexible way

during the design process of new interventions by researchers and practitioners of the Urban Green Infrastructure network.

Thanks to the flexibility of the tools, this methodology could be exported to other cases and cities, contributing to the characterization of their green elements and the development of new strategies for urban green infrastructure.

4.2 On landscape perception. Some specific topics arising from the analysis with NVIVO.

The researcher acts as a "traveler who follows" the interviewees in their narratives (Kvale, 2011), walking through landscapes and engaging in conversations with the people he/she encounters. Conducting interviews with local people is an opportunity to uncover the most relevant local perceptions and corroborate the potential of Urban Green Infrastructure to trigger positive emotions and behaviors from a physical, mental and social perspective.

The qualitative analysis has provided results related to issues such as the everyday experience of place, the sense of belonging and attachment in relation to urban green infrastructure, the role of the case studies as urban thresholds, their connectivity, multifunctionality and accessibility, the image of the city or the relationship between well-being and urban green infrastructure (Santo-Tomás et al., 2020).

Regarding references to the context in the case studies, we note that these are divided into references to the neighborhood itself, to the historical context or to other green areas that are connected to the park in question. The fact that the case study is part of the everyday routines of the vast majority of the interviewees means that, in many cases, results show a deep and meaningful relationship with the place.

The greatest number of references to the neighborhood is seen in the *Parque Lineal del Manzanares*, where almost every interviewee believes that the park has brought quality to the neighborhood, and that they feel it as their own, especially considering the neglected state in which it used to be. The case of *Dehesa de la Villa* is worth noting because, while there are few references to the neighborhood itself in terms of the relationship with the green spaces, many have memories associated with it, showing great attachment to the place. In contrast, in *Valdebebas Forest Park*, although the presence of the park is valued, a deep sense of belonging to the place has not yet been developed.

Time can increase this bond between people and the elements of urban green infrastructure; elements that, as the interviews have shown, tend to be valued in a very positive way within a community. Thus, the individual elements shaping the green infrastructure network become key features in the creation and association with memorable moments.

5 Conclusions

The complexity of landscape perception and of the urban infrastructure network in particular, makes combining tools that study objective elements of the place with tools that study subjective aspects not only relevant, but essential. This is the reason why

qualitative techniques, which allow us to understand the true experience of the place, constitute the main focus of this study.

Overall, the results of this approach show its potential for monitoring landscape change, illustrating a multifaceted view of the rural-urban experience. Therefore, it can become a useful tool in both the design and management of the lived environment. The analysis method employed, based on the use of NVIVO, contributes to extend the tools of "Landscape Character Assessment", provides agents from many disciplines (e.g., landscape architecture, urban planning, geography, or environmental psychology) with relevant information for decision making when dealing with new urban designs. In this case located in the urban green infrastructure network.

After the implementation of this research, we have decided to employ this terminology: "technical view" and "everyday view", in order to avoid the statement that there is an "expert" and "non-expert" view, even though these were the terms used in the definition of the methodology, as they are usually found in the literature. It is really worth questioning who are the true "experts" of the place; those who have an analytical view based on technical knowledge about it, or those who live in the landscape as part of their everyday life.

In this sense, the use of NVIVO is especially valuable when studying highly subjective concepts such as the experience of place and landscape perception, where it is necessary to adopt qualitative tools that allow for their systematic study.

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