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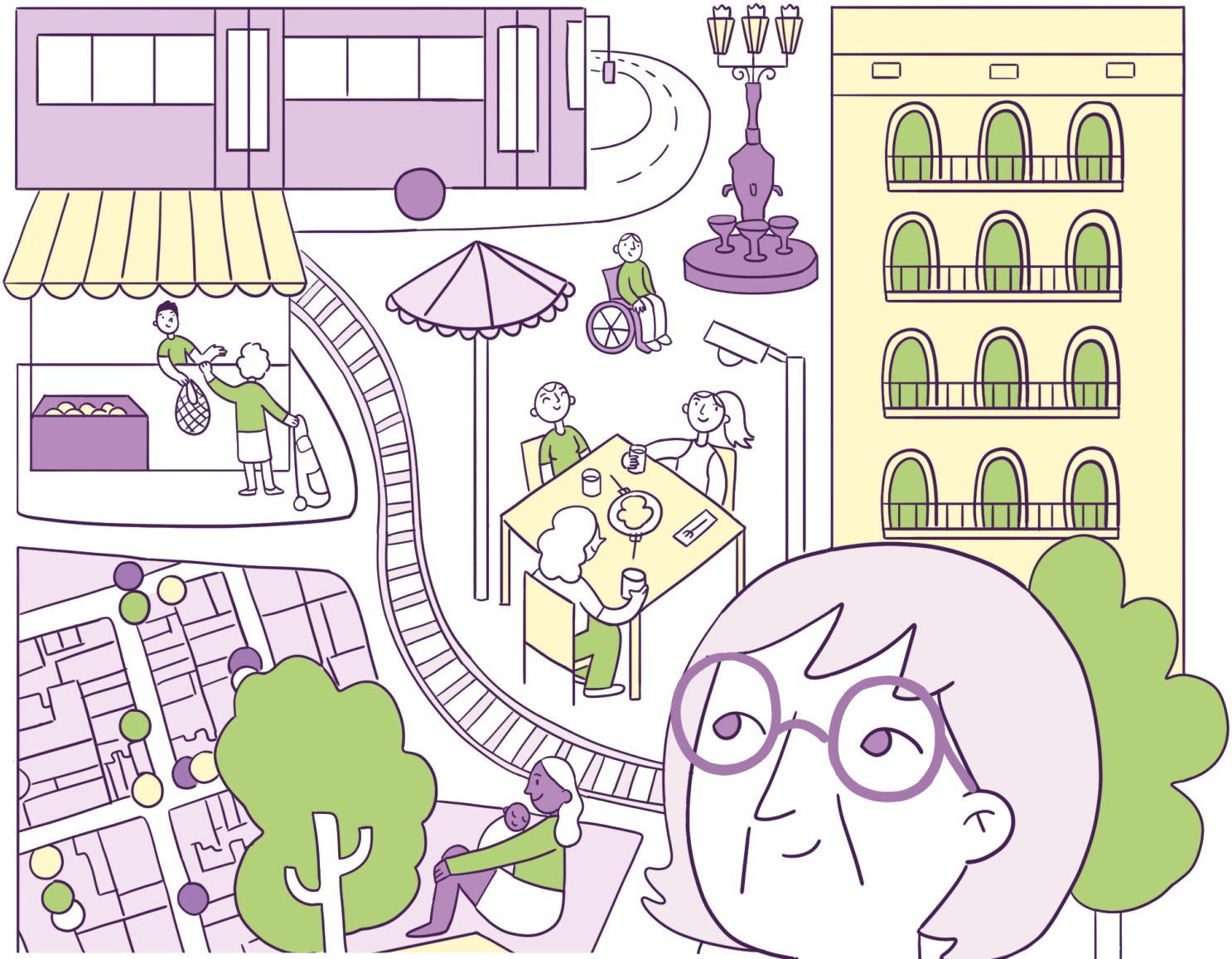
La vitalidad urbana en la metrópolis de Barcelona
Una reinterpretación contemporánea del legado de Jane Jacobs

Irene Gómez Varo



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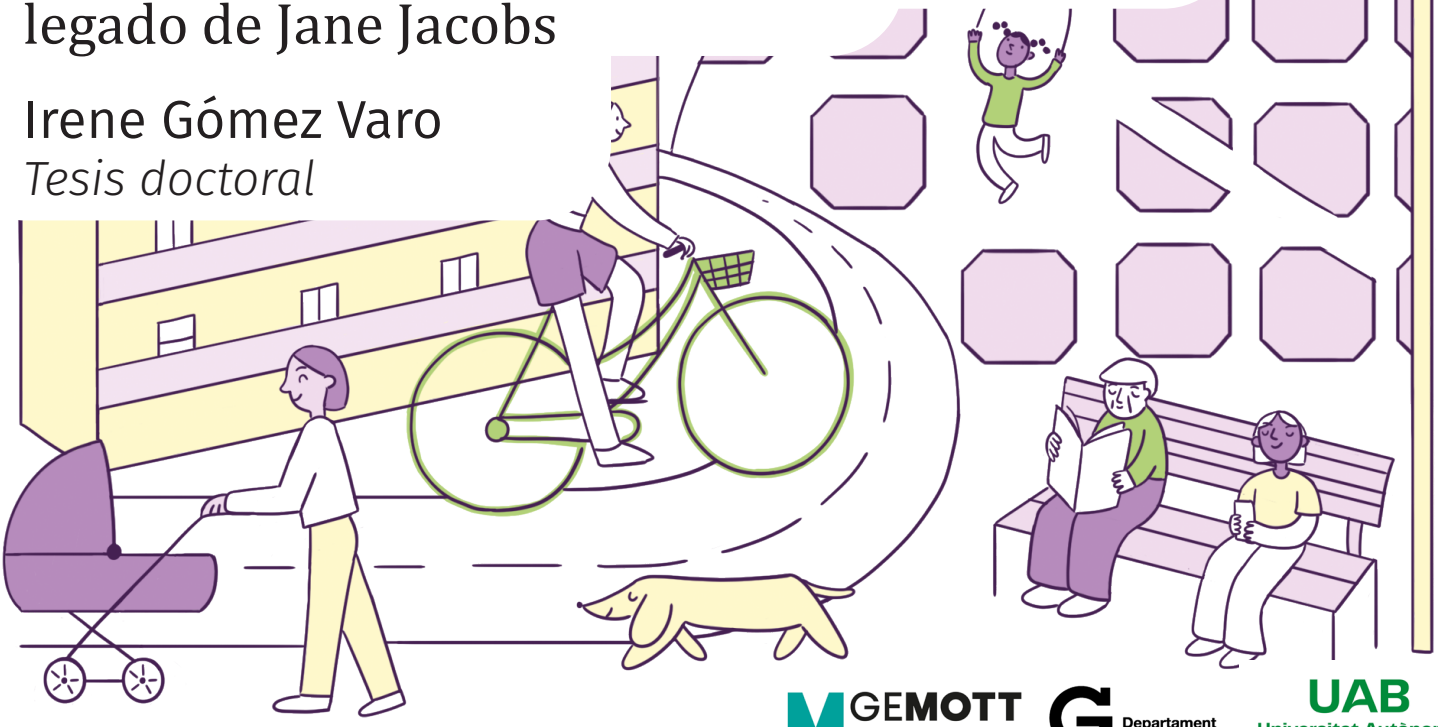
Tesis doctoral



GEMOTT Grup d'Estudis de Mobilitat Transport i Territori
Departament de Geografia
UAB Universitat Autònoma de Barcelona

Tesis doctoral

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Programa de Doctorado en Geografía

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Las grandes ciudades son demasiado grandes y complejas como para ser comprendidas al detalle desde cualquier punto, aunque sea el más alto, por cualquier ser humano. Pero la esencia está en el detalle.

Jane Jacobs

Muerte y vida de las grandes ciudades americanas, 1961

PREFACIO

La presente tesis doctoral sigue el formato de presentación de tesis doctorales por compendio de publicaciones, conforme a la normativa vigente aprobada por la Comisión Académica del Programa de Doctorado (CAPD) del Departamento de Geografía de la Universitat Autònoma de Barcelona, regulado por el Real Decreto RD99/2011 y la normativa específica de presentación de tesis por compendio de publicaciones actualizada el 13 de octubre de 2022.

Para esta tesis, se aportan cinco contribuciones científicas originales, presentadas en forma de artículo científico. A fecha de hoy, cuatro de estas contribuciones han sido aceptadas por el equipo editorial de las revistas receptoras de impacto internacional, y una de ellas se encuentra en fase de revisión. A continuación, se detallan las referencias bibliográficas de cada una de las publicaciones, así como los principales indicadores de impacto académico según el Journal Citation Report®.

1. **Gómez-Varo, I.**, Delclòs-Alió, X., & Miralles-Guasch, C. (2022). Jane Jacobs reloaded: A contemporary operationalization of urban vitality in a district in Barcelona. *Cities*, 123(103565), 1–15. https://doi.org/10.1016/j.cities.2022.103565. JCR 2022: Impact factor (IF) = 6.7, Journal Rank = Q1 Urban Studies.

2. **Gómez-Varo, I.**, Delclòs-Alió, X., Miralles-Guasch, C., & Marquet, O. Are vital neighbourhoods socially privileged? Exploring the spatial relationship between urban vitality and urban vulnerability. Enviado a la revista *Local Environment* en fecha 18/12/2022.

3. **Gómez-Varo, I.**, Delclòs-Alió, X., Miralles-Guasch, C., & Marquet, O. (2023). Unravelling retail diversity through its spatial relationship with social vulnerability and tourism pressures in Barcelona. *Journal of Urban Design*, 0(0), 1–21. https://doi.org/10.1080/13574809.2023.2245761. JCR 2022: Impact factor (IF) = 2.1, Journal Rank = Q2 Urban Studies.

4. **Gómez-Varo, I.**, Delclòs-Alió, X., Miralles-Guasch, C., & Marquet, O. (2023). Accounting for care in everyday mobility: An exploration of care-related trips and their sociospatial correlates. *Geografiska Annaler: Series B, Human Geography*, 1–17. https://doi.org/10.1080/04353684.2023.2226157. JCR 2022: Impact factor (IF) = 1.4, Journal Rank = Q4 Geography.

5. **Gómez-Varo, I.**, Delclòs-Alió, X., Miralles-Guasch, C., & Marquet, O. (2023). Youth Perception of Urban Vitality: A PhotoVoice Study on the Everyday Experiences of Public Space. *Journal of Planning Education and Research*, 0739456X231171098. https://doi.org/10.1177/0739456X231171098. JCR 2022: Impact factor (IF) = 2.2, Journal Rank = Q3 Urban Studies.

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Innovación y Universidades del Gobierno de España. Así mismo, la presente tesis doctoral también se ha apoyado en la financiación de los siguientes proyectos de investigación:

- **Social Transport Equity by Planning for Proximity (STEPP)**. SR22-00147. Institución financiadora: Fundació La Caixa. Fechas: 12/01/2022 - 31/12/2023. Responsable: Oriol Marquet (Institut de Ciència i Tecnologia Ambientals, ICTA-UAB).

- **Electric, light and Shared. The rise of micromobility in Spain and its environmental, social and Health consequences. A multimethod study using GIS, tracking and accelerometry (MICROMOV)**. PID2019-104344RB-I00. Institución financiadora: Ministerio de Ciencia e Innovación (Gobierno de España). Fechas: 01/01/2019 - 31/12/2022. Responsable: Carme Miralles-Guasch (Universitat Autònoma de Barcelona).

- **Imatges vitals, espais de vida i cura a Barcelona.** 21S01865-001. Institución financiadora: Ajuntament de Barcelona. Fechas: 20/12/2022 - 31/04/2023. Responsable: Oriol Marquet (Institut de Ciència i Tecnologia Ambientals, ICTA-UAB).

- **Active and healthy daily mobility in proximity urban enviornment. Multimethodological approaches: tracking living labs, mobility survey and qualitative studies.** CSO2016-74904-R. Institución financiadora: Ministerio de Economía y Competitividad (Gobierno de España). Fechas: 01/01/2017 - 31/12/2019. Responsable: Carme Miralles-Guasch (Universitat Autònoma de Barcelona).

- **Vitalitat urbana al districte de Nou Barris de Barcelona. Análisis de les condiciones morfològiques per la vitalitat urbana.** Institución financiadora: Ajuntament de Barcelona. Fechas: 01/01/2019 - 31/07/2019. Responsable: Carme Miralles-Guasch (Universitat Autònoma de Barcelona).

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Irene.

RESUMEN

El desafío actual de las ciudades es convertirse en espacios *vivibles* que garanticen el bienestar de sus habitantes. En este contexto, ha surgido un renovado interés por el concepto teórico de *vitalidad urbana* de Jane Jacobs, quien vinculó determinadas cualidades del diseño urbano con la existencia de interacciones sociales de personas diversas en el espacio público, utilizado para llevar a cabo diferentes actividades cotidianas. Las condiciones de vitalidad urbana se consideran hoy en día indicadores de calidad de vida y de sostenibilidad ambiental y social que guían la políticas urbanas. Desde el ámbito académico en los últimos años existe una línea de investigación reciente que trata de examinar de manera aplicada la vitalidad urbana y sus condiciones en diferentes ciudades del mundo.

En esta discusión global, cabe preguntarse: ¿cómo se pueden reinterpretar las ideas de vitalidad urbana en el contexto actual de las ciudades mediterráneas? ¿Cómo se manifiestan las condiciones de vitalidad urbana en estos contextos? ¿Qué relación tienen estas condiciones con los diferentes dinámicas y procesos sociales que se están dando en la actualidad?

La tesis parte de estas preguntas y las aplica al estudio concreto de la metrópolis de Barcelona, estudiando las condiciones teóricas de vitalidad urbana definidas por Jacobs bajo una perspectiva contemporánea y tratando de entender la relación de estas condiciones del entorno construido con las dinámicas sociales que desafían la vida cotidiana en los barrios, considerando aspectos como la vulnerabilidad social, el turismo y la perspectiva de género.

Para ello, la tesis utiliza un enfoque multimetodológico y multiescalar, que combina diferentes técnicas de análisis espacial tanto con un enfoque cuantitativo como cualitativo, permitiendo obtener una comprensión amplia de la vitlalidad urbana en el contexto de análisis. De esta manera, la tesis doctoral se fundamenta en cinco estudios de caso presentados en forma de artículos científicos en revistas académicas. Cada uno de estos estudios de caso explora la vitalidad urbana desde distintos enfoques y la relaciona con variables diversas. Los resultados obtenidos pueden ser de utilidad para futuras estrategias de planificación urbana orientadas a la creación de entornos vitales en el contexto de la ciudad mediterránea, al mismo tiempo que contribuyen a enriquecer el debate global sobre este tema.

RESUM

El repte actual de les ciutats és esdevenir espais *vivibles* que garanteixin el benestar dels seus habitants. En aquest context, ha sorgit un renovat interès pel concepte teòric de *vitalitat urbana* de Jane Jacobs, qui va vincular determinades qualitats del disseny urbà amb l'existència d'interaccions socials de persones diverses a l'espai públic, utilitzat per dur a terme diferents activitats quotidianes. Les condicions de vitalitat urbana es consideren avui en dia indicadors de qualitat de vida i de sostenibilitat ambiental i social que guien les polítiques urbanes. Des del camp acadèmic, en els últims anys, ha sorgit una línia d'investigació recent que tracta d'examinar de manera aplicada la vitalitat urbana i les seves condicions en diferents ciutats del món.

En aquesta discussió global, cal preguntar-se: com es poden reinterpretar les idees de vitalitat urbana en el context actual de les ciutats mediterrànies? Com es manifesten les condicions de vitalitat urbana en aquests contextos? Quina relació tenen aquestes condicions amb les diferents dinàmiques i processos socials que estan succeint actualment?

La tesi parteix d'aquestes preguntes i les aplica a l'estudi concret de la metròpolis de Barcelona, investigant les condicions teòriques de vitalitat urbana definides per Jacobs des d'una perspectiva contemporània i tractant d'entendre la relació d'aquestes condicions de l'entorn construït amb les dinàmiques socials que desafien la vida quotidiana als barris, considerant aspectes com la vulnerabilitat social, el turisme i la perspectiva de gènere.

Per a això, la tesi utilitza un enfocament multimetodològic i multiescalar, que combina diferents tècniques d'anàlisi espacial tant amb un enfocament quantitatiu com qualitatiu, permetent obtenir una comprensió ampla de la vitalitat urbana en el context d'anàlisi. D'aquesta manera, la tesi doctoral es fonamenta en cinc estudis de cas presentats en forma d'articles científics en revistes acadèmiques. Cada un d'aquests estudis de cas explora la vitalitat urbana des de diferents enfocaments i la relaciona amb variables diverses. Els resultats obtinguts poden ser d'utilitat per a futures estratègies de planificació urbana orientades a la creació d'entorns vitals en el context de la ciutat mediterrània, al mateix temps que contribueixen a enriquir el debat global sobre aquest tema.

ABSTRACT

Cities are currently striving to transform into liveable spaces that ensure the well-being of their residents. In this context, there has been a renewed interest in the theoretical concept of *urban vitality* by Jane Jacobs, who linked certain qualities of urban design with the presence of social interactions in public spaces where diverse individuals engage in various everyday activities. Urban vitality conditions are now considered indicators of quality of life and environmental and social sustainability, guiding urban policies. In recent years, the academic sphere has seen a growing line of research that seeks to examine, in an applied manner, urban vitality and its conditions in different cities worldwide.

In this global discussion, one may ask: How can we reinterpret the ideas of urban vitality in the current context of Mediterranean cities? How do urban vitality conditions manifest in these contexts? What is the relationship between these conditions and the various social dynamics and processes currently unfolding?

This thesis tackles these questions and applies them to the specific study of the metropolis of Barcelona, investigating the theoretical conditions of urban vitality defined by Jacobs from a contemporary perspective and seeking to understand how these built environment conditions relate to the social dynamics challenging everyday life in neighborhoods, considering aspects such as social vulnerability, tourism, and gender perspectives.

In order to achieve this, this thesis employs a multimethodological and multiscale approach, combining different spatial analysis techniques, both quantitative and qualitative, to provide with a comprehensive understanding of urban vitality within the study area. As such, the doctoral thesis is grounded in five case studies presented in the form of scientific articles in academic journals. Each of these case studies explores urban vitality from different approaches and correlates it with diverse variables. The findings can be valuable for future urban planning strategies aimed at creating vital environments in the Mediterranean city context while also contributing to enrich the global debate on this subject.

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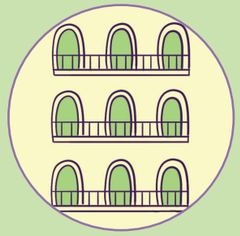
PARTE I:

INTRODUCCIÓN



Capítulo 1

Justificación del estudio y antecedentes

Las ciudades se han convertido en el escenario principal de la vida cotidiana para la gran mayoría de la población mundial. Según Naciones Unidas, en 2018, el 55% de la población mundial vivía en entornos urbanos, y se calcula que para el 2050 este porcentaje alcanzará el 68% (United Nations, 2018). Estas proporciones son aún más elevadas en regiones como Europa, Norte América o Latinoamérica y el Caribe, donde los niveles de urbanización alcanzaron el 74%, el 82% y el 81%, respectivamente. El reto de las ciudades hoy es trascender su naturaleza inicial de ser un lugar donde vive un conglomerado de personas, y convertirse en lugares *vivibles*, capaces de garantizar el bienestar y la calidad de vida de sus habitantes.

El entorno construido desempeña un papel crucial en el bienestar cotidiano. El desarrollo urbano del modelo de planificación funcionalista de principios del siglo XX, basado en la dispersión de actividades conectadas por infraestructuras viales de alta capacidad, dificulta y complica la vida cotidiana. Este modelo ha llevado al aumento de las distancias, los tiempos y las velocidades de desplazamiento necesarios para satisfacer las necesidades diarias, y ha resultado en la pérdida de actividad en las calles y de la interacción en los barrios. En contraposición a este modelo, en las últimas décadas ha resurgido la importancia de la proximidad como un atributo valioso en la planificación urbana. Se entiende por entorno urbano de proximidad aquellos diseños urbanos en los que haya poca distancia geográfica entre las personas y sus actividades cotidianas (Marquet & Miralles-Guasch, 2014; Solá & Vilhelmson, 2018a). Estos entornos juegan un papel fundamental en la promoción de la salud, el bienestar, la equidad y la resiliencia de los barrios, algo que se ha hecho aún más evidente tras la crisis provocada por la pandemia de la COVID 19 (Global Mayors COVID-19 Recovery Task Force 2020; Springer 2020).

En esta apuesta por la proximidad, en los últimos años ha surgido un creciente interés por retomar el concepto de vitalidad urbana acuñado por Jane Jacobs, que se ha relacionado con la idea de que la ciudad debe ser un lugar *vivible* de manera cotidiana. En su obra *Muerte y vida de las grandes ciudades* (1961), Jacobs lleva a cabo un análisis cotidiano y cualitativo del entorno construido, identificando elementos específicos que fomentan lo que la autora denomina como vitalidad urbana, es decir, la presencia de una diversidad de personas que transitan las calles, realizan en ellas diferentes actividades e interactúan en el espacio público. Su enfoque resultó revolucionario en el contexto de los años sesenta, ya que precisamente contrastaba con la ortodoxia del planeamiento urbano funcionalista. Jacobs insistió en la necesidad de observar la vida urbana desde una perspectiva cotidiana, considerando los usos y las personas como elementos centrales, y de incorporar al análisis a sujetos invisibilizados.

Pero, sin duda, uno de los aspectos más valiosos del esfuerzo teórico de Jacobs es que la autora vincula la vitalidad con un diseño específico de la forma urbana. Esto resulta relevante desde el punto de vista de la planificación urbana ya que sugiere que, partiendo de determinadas

condiciones del entorno construido, es posible diseñar ciudades vitales, seguras y con una alta interacción en las calles. Así, vemos que durante la última década ha habido una notable atención por los principios de Jane Jacobs por parte de las instituciones públicas, que los han utilizado como guía para las políticas urbanas, pues la vitalidad y las condiciones que la originan han sido consideradas como un indicador de calidad de vida y buen urbanismo (NACTO, 2013; United Nations, 2015).

El interés por las ideas de Jane Jacobs ha trascendido al ámbito académico, donde varios autores han estado investigando sus teorías desde una perspectiva aplicada en los últimos años (Braun & Malizia, 2015; De Nadai et al., 2016; Humphrey et al., 2017; Lopes & Camanho, 2013; Marquet & Miralles-Guasch, 2016; Sassen, 2016; Shi et al., 2019; Sung et al., 2013). Estos estudios han aprovechado la disponibilidad de nuevas fuentes de datos georreferenciados sobre entornos urbanos y se han centrado principalmente en analizar las condiciones de vitalidad definidas originalmente por Jacobs en diversos contextos urbanos contemporáneos.

Sin embargo, hay menos investigaciones que aborden estas ideas de manera actualizada y desde el contexto mediterráneo. Resulta de interés comprender cómo se traducen las condiciones de vitalidad en una ciudad mediterránea como Barcelona, cuya morfología urbana dista del contexto donde se originaron las teorías de vitalidad urbana en la ciudad de Nueva York de los años sesenta. El desarrollo histórico de las ciudades mediterráneas ha seguido un crecimiento más orgánico a lo largo de los siglos comparado con el de ciudades más recientes, por lo que encontremos una variedad de tramas urbanas en las que es interesante analizar las condiciones del entorno construido que generan vitalidad urbana.

Así mismo, resulta relevante para el estudio de las ciudades contemporáneas comprender cómo se relacionan las condiciones de vitalidad con las dinámicas sociales cotidianas relevantes para los desafíos urbanos actuales en términos de equidad y sostenibilidad social, un campo de análisis incipiente en la literatura sobre vitalidad urbana. En este sentido, el caso concreto de Barcelona resulta interesante en tanto que ciudad global se enfrente a dinámicas sociales como el aumento de las desigualdades intraurbanas, la gentrificación o la presión turística que podrían estar afectando a la vitalidad urbana.

Finalmente, cabe destacar también que la mayoría de estudios existentes siguen una metodología de naturaleza cuantitativa y una gran parte de estos hacen un análisis a gran escala. Sin embargo, la visión teórica de Jacobs parte de entender la vitalidad urbana desde la esfera cotidiana, entendiendo las múltiples interacciones que se dan en los espacios urbanos a diferentes niveles, por lo que resulta de interés examinarla desde diferentes perspectivas y escalas de análisis. Por ello, esta tesis plantea el estudio de la vitalidad desde un diseño multimetodológico y multiescalar que combina diferentes técnicas de investigación y fuentes de datos.

Capítulo 2

Presentación de la investigación

2.1. Preguntas de investigación, hipótesis y objetivos

En este capítulo, se presentarán las preguntas de investigación, hipótesis y objetivos que estructuran esta tesis doctoral. Esta se centra en dos preguntas de investigación principales, desglosadas en preguntas secundarias más específicas. A su vez, de cada pregunta específica se desprende una hipótesis y un objetivo, que sirven como guías de trabajo y estructura para el diseño del análisis y la interpretación de los resultados.

Pregunta 1: ¿Qué relación existe entre las condiciones para la vitalidad urbana según Jacobs (1961) y las características de las ciudades mediterráneas actuales?

Pregunta específica 1.1: *¿En qué medida las teorías de la vitalidad urbana propuestas por Jane Jacobs en 1961 son aplicables a las dinámicas de las ciudades mediterráneas actuales y cómo han sido ampliadas y actualizadas en el contexto contemporáneo?*

- Hipótesis 1: Las teorías de Jane Jacobs sobre la vitalidad urbana son válidas y relevantes para analizar las ciudades mediterráneas actuales pero requieren una reinterpretación teórica que incorpore las corrientes de pensamiento contemporáneas.

- Objetivo 1: Identificar los conceptos y enfoques teóricos desarrollados posteriormente a Jane Jacobs que se relacionen con sus principios de vitalidad urbana, con el fin de ampliar y recontextualizarlas en un contexto actual, y en particular, en el contexto de la ciudad mediterránea.

Pregunta específica 1.2: *¿Cómo se pueden analizar las condiciones teóricas de la vitalidad urbana de manera aplicada teniendo en cuenta diversos contextos urbanos y sujetos de análisis?*

- Hipótesis 2: Las nuevas herramientas de análisis espacial disponibles en la actualidad permiten evaluar y comprender la vitalidad urbana de manera aplicada en una diversidad de contextos urbanos y a partir de la experiencia de una diversidad de sujetos.

- Objetivo 2: Desarrollar un enfoque metodológico para evaluar la vitalidad urbana en el contexto de las realidades urbanas mediterráneas actuales, tanto técnicas cuantitativas que permitan operativizar las condiciones de vitalidad urbana en el espacio, como enfoques cualitativos que permitan el análisis de percepciones y las experiencias de las personas que habitan la ciudad.

Pregunta específica 1.3: *¿Cómo se trasladan espacialmente las condiciones de la vitalidad urbana en los contextos urbanos de las ciudades mediterráneas actuales?*

- Hipótesis 3: Las condiciones que propician la vitalidad urbana se presentan en entornos urbanos caracterizados por una variedad de estructuras morfológicas y composiciones sociales.

- Objetivo 3 : Entender cómo se manifiesta la vitalidad urbana en diversos contextos urbanos de las metrópolis mediterráneas, teniendo en cuenta la diversidad de morfologías urbanas, realidades socioeconómicas y grupos sociales.

Pregunta 2: ¿De qué manera interactúan los principios de la vitalidad urbana con las dinámicas cotidianas y los procesos sociales de las ciudades contemporáneas, considerando la perspectiva de la sostenibilidad, la justicia social y el género?

Pregunta específica 2.1. *¿Cuál es la relación entre las condiciones de vitalidad urbana y procesos contemporáneos de la ciudad global mediterránea, como el aumento de las desigualdades sociales intraurbanas y la presión turística?*

- Hipótesis 4: La vitalidad se da en entornos socialmente privilegiados.

- Hipótesis 5: La vitalidad urbana convive con dinámicas de exclusión social perjudiciales para la vida cotidiana de los barrios como la alta presión turística.

- Objetivo 4: Entender cómo las condiciones para la vitalidad urbana se relacionan espacialmente con las dinámicas de la ciudad global mediterránea, como la existencia de desigualdades sociales intraurbanas y la presión turística.

Pregunta específica 2.2. *¿En qué medida las condiciones de vitalidad urbana influyen en la promoción de la sostenibilidad de la vida y la provisión de cuidados en los entornos urbanos?*

- Hipótesis 6: Las condiciones de la vitalidad urbana sustentan y apoyan la satisfacción de las necesidades cotidianas de cuidado.

- Objetivo 5: Entender la relación entre los entornos urbanos y las actividades cotidianas del cuidado.

2.2. Estructura de la tesis

La presente tesis doctoral sigue el formato de tesis por compendio de artículos, y se estructura en torno a un conjunto de estudios empíricos que constituyen su núcleo principal. A continuación, se describe la estructura de la tesis:

Parte I: Introducción al proyecto de investigación

La Parte I introduce esta tesis doctoral. En el Capítulo 1 se presentan los antecedentes y la justificación de la temática de estudio. Y en el Capítulo 2 se exponen las preguntas de investigación, las hipótesis y los objetivos del trabajo, y se brinda una explicación detallada de la estructura de la tesis.

Parte II: Marco teórico

La Parte II ofrece una visión general de los conceptos teóricos que se emplean en los estudios de caso. El Capítulo 3 aborda los orígenes del concepto central de esta tesis, la vitalidad urbana, y sus condiciones. A c ontinuación, en el Capítulo 4, se realiza una revisión de los autores y corrientes de pensamiento que posteriormente a Jacobs han abordado estos conceptos teóricamente. Y finalmente, en el Capítulo 5 se lleva a cabo una revisión de las investigaciones que han utilizado estos conceptos de manera aplicada.

Parte III: Metodología

En esta sección, se presenta el Capítulo 6, que aborda el marco metodológico de la tesis. Se explica el enfoque multimetodológico y multiescalar utilizado en la investigación, se describe el ámbito de estudio de la metrópolis de Barcelona y se detallan las técnicas y fuentes de datos utilizadas en el análisis.

Parte IV: Resultados

La Parte IV se compone de los cinco estudios de caso que constituyen el núcleo central de la tesis doctoral. En el Capítulo 7, se presenta el primer estudio de caso, que se basa en la operativización cuantitativa y espacial del concepto teórico de la vitalidad urbana desde una perspectiva contemporánea mediante la creación de un índice sintético. Esto servirá de base para cartografiar el potencial de vitalidad urbana en la metrópolis de Barcelona y relacionarlo con otras realidades sociales. A continuación, el Capítulo 8 presenta tres estudios de caso que exploran las relaciones entre las condiciones de vitalidad urbana y diferentes realidades cotidianas, como la vulnerabilidad social, el turismo y la movilidad del cuidado. Finalmente, el Capítulo 9 introduce el quinto estudio de caso, que propone la metodología cualitativa de fotovoz para estudiar la vitalidad urbana.

Parte V: Discusión conjunta y conclusiones

En esta sección, se realiza una discusión y conclusión global de la tesis. El Capítulo 10 se dedica a esta discusión y conclusión conjunta derivadas de los principales resultados obtenidos en los cinco estudios de caso realizados. En el Capítulo 11 se ofrecen reflexiones finales sobre las potencialidades y limitaciones de la tesis, las futuras líneas de investigación y las implicaciones para el desarrollo de políticas urbanas.

Parte VI Referencias

En esta sección se detallan las referencias bibliográficas usadas en este documento.

Parte VII Anexo

Por último, se incluye un Anexo con información complementaria a la tesis. En el Capítulo 12 se detallan las actividades desarrolladas en el marco de la tesis doctoral dedicadas a la difusión de los resultados y a la formación de la doctoranda. El Capítulo 13 contiene la documentación requerida por el Programa de Doctorado en Geografía y la Escuela de Doctorado de la Universitat Autònoma de Barcelona para la presentación de la tesis por compendio de artículos y la obtención de la mención internacional de doctorado.

PARTE II:

MARCO TEÓRICO

Capítulo 3

Jane Jacobs y la vitalidad urbana

3.1. Los orígenes del concepto: el contexto de Nueva York en la década de 1960

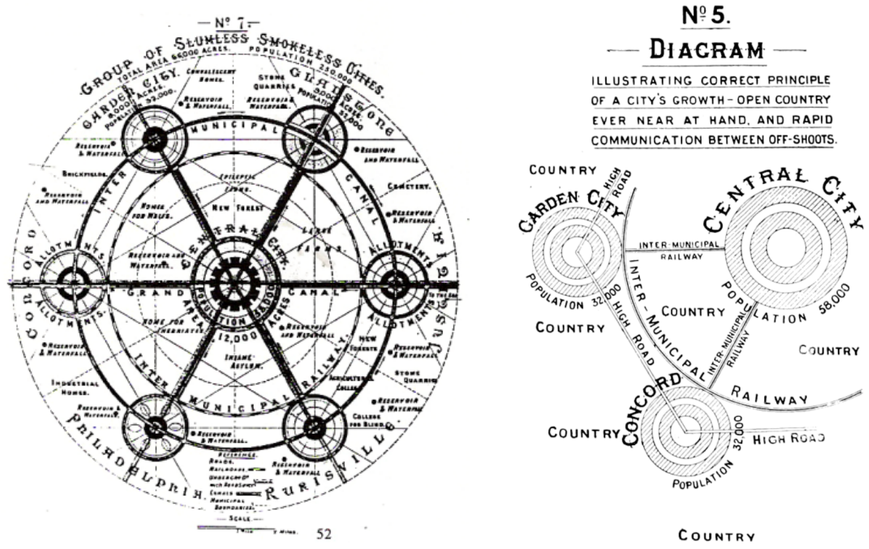
El concepto central de esta tesis doctoral es el de la vitalidad urbana, acuñado por Jane Jacobs y que aparece por primera vez en su obra más célebre, titulada originalmente *The Death and Life of Great American cities* (1961). Antes de abordar la definición y las raíces teóricas del concepto, este primer subapartado tiene como objetivo introducir el contexto en el que se desarrolló, ya que las condiciones históricas en las que se originó, el Nueva York de mediados del siglo XX, son esenciales para su comprensión.

Tras la II Guerra Mundial, en la década de los años 50, Estados Unidos experimentó un gran crecimiento económico marcado por la producción industrial y el aumento de la demanda de consumo de bienes y servicios, entre los cuales tuvo un gran peso la industria del automóvil (Fishman, 1982). Al mismo tiempo, también crecieron las ciudades, que acogían a población migrante de las áreas rurales del país. Para dar respuesta a las necesidades de estas ciudades industriales en expansión, fueron muy influyentes las teorías de la ciudad moderna y el urbanismo funcionalista del siglo XX, que propusieron nuevos diseños urbanos a gran escala bajo el criterio de la eficiencia (opus cit.). Estos nuevos enfoques, en realidad, tienen su origen en Europa, a partir de las teorías de figuras emblemáticas como Ebenezer Howard y su propuesta de la Ciudad Jardín (Howard, 1898) y de Le Corbusier y su propuesta de Ciudad Radiante (Le Corbusier, 1935).

El proyecto de la Ciudad Jardín (1898) proponía resolver los problemas derivados del crecimiento demográfico a partir de la creación de ciudades en medio de zonas rurales cuya forma urbana estuviera compuesta por una ciudad central como núcleo y seis ciudades o comunidades residenciales suburbanas independientes comunicadas entre sí a partir del transporte ferroviario (Figura1). Se trata de un plan que proponía una moderada descentralización y una relación equilibrada entre la ciudad construida, que debía estar limitada a un máximo de 30.000 habitantes, y la naturaleza, que debía rodear la ciudad mediante un “cinturón verde”.

Por su parte, el proyecto de la Ciudad Radiante (1935) planteaba la organización de la ciudad a partir de cuatro funciones principales: la residencia, el trabajo, el ocio y la circulación. Para organizar estas funciones propone una distribución segregada de estas actividades en el espacio, las dos primeras organizadas en edificios altos y homogéneos, que permitirían dejar espacio libre para grandes ejes verdes donde se llevaría a cabo la tercera función, la recreacional (Figura 2). La conexión entre estas funciones se realizaría mediante amplias avenidas y carreteras donde el principal medio de transporte era el automóvil.

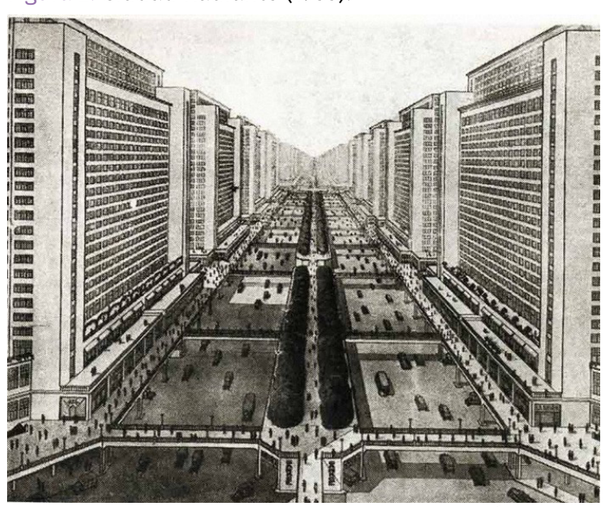
Figura 1. Diagrama de la Ciudad Jardín (1898).



Fuente: Howard, E. (1898). Garden cities of to-morrow. Attic books.

Las ciudades estadounidenses, y en particular la ciudad de Nueva York, donde Jane Jacobs vivió desde su edad adulta, se convirtieron en escenarios donde se desarrollaron proyectos urbanos fundamentados en la lógica funcionalista, especialmente bajo la dirección del influyente planificador Robert Moses (Ballon & Kenneth, 2007). Moses desempeñó un papel destacado como Comisionado de Parques de la ciudad y supervisó la construcción de numerosos proyectos de infraestructura (opus cit.). Creía firmemente en el poder de la planificación urbana como medio para fomentar el crecimiento y el progreso de la ciudad, y sostenía que la mejora de la calidad de vida de la población neoyorquina requería inversiones públicas en infraestructuras estatales, como la creación de parques, áreas recreativas y espacios verdes para brindar oportunidades de esparcimiento a la población. Además, Moses promovió proyectos de viviendas públicas destinados a residentes de bajos ingresos con el propósito de mejorar las condiciones de vida en áreas urbanas consideradas deterioradas. Siguiendo la propuesta del urbanismo funcionalista, estos proyectos consistieron en la construcción de grandes edificios de apartamentos homogéneos con espacios públicos intra-bloque meticulosamente planificados. Asimismo, Moses destacó por su labor en la construcción de amplias infraestructuras de transporte que

Figura 2. Ciudad Radiante (1935).



Fuente: Le Corbusier. (1935). La Ville Radieuse. Éditions de l'Architecture D'aujourd'hui.

conectaban el centro de la ciudad, facilitando el acceso mediante el automóvil.

Estos proyectos, sin embargo, también supusieron la demolición de barrios históricos de la ciudad, la segregación social de la población más vulnerable en los barrios residenciales de vivienda social y la consolidación de un modelo de movilidad basado en el automóvil (Jackson, 1987). Estas consecuencias causaron la aparición de voces contrarias a estas intervenciones urbanísticas en los movimientos de protesta ciudadana, entre las cuales destaca la propia Jane Jacobs, y que se opusieron en numerosas ocasiones a proyectos como el de la construcción de la autopista Lower Manhattan o de un parking subterráneo en el parque de Washington Square (Flint, 2009).

Jane Jacobs, además de participar como activista, en su faceta profesional como periodista, también publicó varios textos en revistas sobre urbanismo y planificación urbana. En el año 1958 publica el artículo *Downtown is for People* en la revista *Fortune* donde hace una primera exposición de las bases de sus principios (Jacobs, 1958). En él, defendió la necesidad de que el centro urbano de Nueva York respondiera a las necesidades de la población residente, a partir de un diseño de urbano compacto, denso, peatonal y con diversidad de usos que propiciara la vida comunitaria.

Sin embargo, no fue hasta la publicación de su obra clave, el libro *Muerte y vida de las grandes ciudades americanas* en 1961, donde explica de manera exhaustiva los fundamentos de sus teorías. La publicación de este libro en el contexto anteriormente descrito resulta muy controvertida, pues este se presenta, en palabras de Jacobs, como un "un ataque contra el actual urbanismo, los principios y los fines que han modelado lo moderno y la reconstrucción urbana" (Jacobs, 1961, p. 29). Esta ruptura con respecto a los patrones dominantes de la planificación urbana del siglo XX resulta de gran interés para los estudios urbanos ya que pusieron en cuestión el *quién* y el *cómo* se piensa la ciudad.

En primer lugar, en cuanto al *quién*, la irrupción de Jacobs en el debate urbano, una mujer, periodista, desafió la figura tradicional del experto en la ciudad, que hasta el momento estaba representada por un hombre con una formación en la gerencia y la gestión empresarial y en disciplinas técnicas como la arquitectura y la ingeniería. En este sentido, su contribución abrió el debate sobre la ciudad a otros actores sociales, poniendo en valor las aportaciones de los propios habitantes de los barrios, y también a otras disciplinas teóricas que analizaran la interacción entre la vida de las personas con la forma urbana, como la sociología o la geografía.

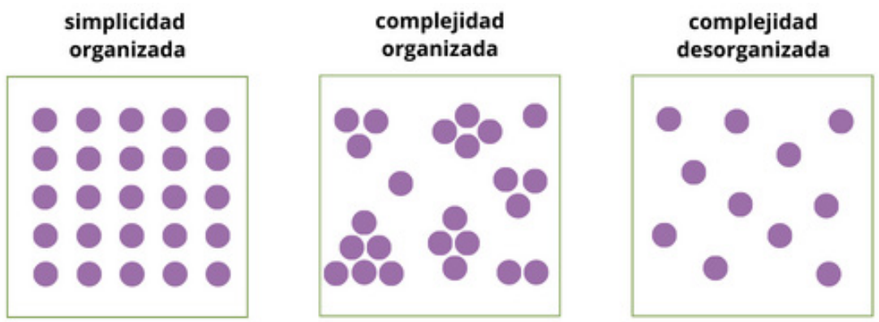
En segundo lugar, Jacobs cambia la manera en *cómo* deben entenderse las ciudades. El pensamiento de Jacobs se articula a partir de sus propias experiencias como residente en el barrio de Greenwich Village en la ciudad de Nueva York, donde observó detalladamente la calle y las actividades que se desarrollaban en ella. A partir de estas observaciones diarias, Jacobs desarrolló una serie de teorías que no se limitaron a la crítica del modelo urbano predominante en la época, sino que propusieron un nuevo marco teórico para el análisis y la planificación de las ciudades. Este enfoque es particularmente valioso para la investigación en los estudios urbanos, ya que proporciona un nuevo marco analítico que se utiliza como base para esta tesis doctoral. El siguiente apartado se centrará en profundizar en estas teorías.

3.2. Ciudades para la vida cotidiana: la importancia de la escala y la ciudad como problema de complejidad organizada

Las teorías de Jane Jacobs expuestas en *Muerte y vida de las grandes ciudades americanas* (1961) supusieron un cambio de paradigma respecto a la corriente de pensamiento hegemónica en el planeamiento contemporáneo (Schubert, 2019). Si la *ciudad funcional* o *ciudad moderna* tiene como pilares la funcionalidad, la eficiencia y la homogeneidad, las teorías de Jacobs propusieron una visión de la ciudad totalmente opuesta, basada en la vida cotidiana, la complejidad y la diversidad. En este capítulo se explican dos ideas clave de su pensamiento para el análisis de la ciudad: la ciudad como *complejidad organizada*, y la importancia de la *escala*.

Jacobs sostuvo que la comprensión de la ciudad había sido limitada hasta el momento porque el pensamiento urbano no había sido capaz de entender el problema al que se enfrentaba (Jacobs, 1961, p. 477). Así, una primera idea a destacar de la autora es que la ciudad es un *problema de complejidad organizada*. Jacobs toma como referencia el ensayo científico de Weaver (1958) sobre ciencia y complejidad en el que se explican los tres tipos de problemas que se abordan en las ciencias naturales y que también se han usado como referencia en el pensamiento urbano (Jacobs, 1961, p. 478): *problemas sencillos*, *problemas de complejidad desorganizada* y *problemas de complejidad organizada* (Figura 3).

Figura 3. Tipos de estructuras de un sistema: simplicidad organizada, complejidad organizada y complejidad desorganizada.



Fuente: elaboración propia a partir de Anand et al., 2010.

A finales del siglo XIX, las teorías urbanísticas de la Ciudad Jardín defendidas por Ebenezer Howard (1898) entendían la ciudad como un *problema sencillo*. Los problemas sencillos, según Weaver (1958), se entienden como sistemas cerrados conformados por la relación dos variables principales. En este caso, la ciudad jardín se entiende como una ciudad aislada que se organiza entorno a la relación entre las variables de población y verde urbano, tal como se explica en el anterior subapartado.

Más tarde, durante principios del siglo XX, las teorías de la Ciudad Radiante de Le Corbusier (1935) analizaron la ciudad como si fueran un *problema de complejidad desorganizada*. Es decir, se toma la ciudad como un sistema, una "colección de cajones" separados en problemas sencillos, y tratan de comprenderla a partir de análisis estadísticos, de probabilidades, y el cálculo de promedios (Jacobs, 1961a, p. 475). Así, según esta lógica, la ciudad es un sistema que puede organizarse racionalmente en problemas matemáticamente solubles.

Finalmente, en los años 60, Jacobs propouso una nueva visión de la ciudad como un *problema de complejidad organizada*. Según esta visión, la ciudad es un organismo que está lleno de múltiples conexiones que interactúan entre sí y que deben ser examinadas cuidadosamente. Para ilustrar esta idea, Jacobs utiliza el ejemplo de un parque urbano (Jacobs, 1961a, p. 478). El uso de un parque urbano depende de varias variables, como el tamaño del parque, el diseño, la presencia de cierto tipo de mobiliario y, además, de las personas que lo visitan y de las que están en las áreas adyacentes. Estos factores, a su vez, dependen de otros factores, como el uso que se le da a las zonas cercanas al parque y la antigüedad de los edificios circundantes. Por lo tanto, la perspectiva de la complejidad organizada busca entender cómo estos diversos factores se relacionan y se afectan mutuamente.

Estas diferentes visiones de la ciudad como diferentes clases de problemas tienen asociados también diferentes maneras de abordar el análisis de la ciudad en cuanto a su escala, llegando así a la segunda idea clave de este subapartado. Las concepciones que abordan problemas sencillos y de complejidad desorganizada, utilizan la vista de pájaro, es decir, la gran escala. Esta visión propia de las teorías de la Ciudad Jardín y la Ciudad Radial trabajan desde razonamientos deductivos, a partir de abstracciones que simplifican la realidad. Este enfoque resulta útil porque permite trabajar de forma generalizada, planificar de manera "científica" a partir de análisis estadísticos. Por ejemplo, planificar el tráfico urbano, la vivienda o los servicios culturales convirtiéndolos en problemas sencillos que pueden resolverse racionalmente mediante el estudio de promedios y probabilidades estadísticas que relacionan matemáticamente dos variables. Sin embargo, este enfoque también se ve limitado ya que existen relaciones no examinadas entre variables que, en realidad, están intrínsecamente interrelacionadas.

Bajo la visión jacobsiana, para comprender los problemas de complejidad organizada como la ciudad, hay que adoptar otros hábitos de pensamiento (Jacobs, 1961a, p. 487). Uno de ellos consiste en analizar la ciudad poniendo el foco en los procesos, y no en los objetos. Es decir, analizando los elementos que componen la ciudad (vivienda, parques, calles…) teniendo en cuenta sus circunstancias particulares y las vivencias de las personas que los habitan. Esto implica a su vez adoptar una mirada inductiva en el análisis, desde lo particular, identificando un factor específico, para llegar a lo general, entendiendo la red de interrelaciones entre factores. De esta manera, se evita trabajar únicamente desde lo abstracto y el foco se centra en lo concreto de la vida cotidiana, prestando atención a las *cosas corrientes y vulgares* (Jacobs, 1961a, p. 29), aquellas que suceden a escala humana.

El estudio de la ciudad desde la cotidianidad y la proporción humana requiere un análisis que combine diferentes niveles de escala. El primer y principal nivel de análisis que Jacobs utiliza es la calle. Las calles son entendidas por la autora como algo más que un elemento de circulación de vehículos y peatones, o, como proponía la Ciudad Radiante, como un elemento de conexión entre las diferentes funciones. Para Jacobs las calles son el principal espacio público de la ciudad, su *órgano más vital* (Jacobs, 1961, p. 55). Es en esta primera escala de calle donde surge la idea clave que toma esta tesis doctoral, la *vitalidad urbana*. Esta sostiene que las calles necesitan ser espacios vitales para el funcionamiento exitoso de la ciudad, cumpliendo una doble función: garantizar la seguridad y propiciar los encuentros casuales y públicos.

Las calles y sus aceras son el escenario de la vitalidad urbana, las encargadas de la "tarea fundamental de mantener la paz pública" en las grandes ciudades, caracterizadas por ser lugares donde coexisten personas desconocidas entre sí. Su concepción de la seguridad se basa en lo que Jacobs denominó la presencia de *ojos en la calle*, una red de vigilancia informal

creada a partir de la presencia cotidiana de personas en el espacio público (Jacobs, 1961a, p. 61). Esta presencia constante de personas, imprescindible para la vitalidad urbana, se desarrolla en un orden complejo que Jacobs compara con una danza, *el ballet de la acera* (Jacobs, 1961, p. 78). Las personas que ocupan la calle figuran como bailarinas, pero sin seguir una coreografía concreta y uniforme, si no que de manera improvisada generan interacciones espontáneas entre las personas que realizan sus actividades cotidianas, dando lugar a diferentes representaciones incluso en el mismo sitio (opus cit.). Al mismo tiempo, estas interacciones generan una red de respeto y confianza que son importantes para generar un "sentimiento de identidad pública". Este sentimiento de identidad acaba siendo un recurso, un capital social en momentos de necesidad personal o vecinal.

Existen también, de manera complementaria, una segunda, tercera y cuarta escala de análisis relevantes para el estudio de la vitalidad urbana: el barrio, el distrito y la ciudad. En la concepción de Jane Jacobs, el barrio se aleja del ideal propuesto en los planes de reordenación de vivienda por la teoría urbanística dominante en la época, que lo concebía como una unidad aislada y delimitada del resto de la ciudad, como si fuera un pueblo. Por el contrario, Jacobs propone la idea de que un barrio no es una unidad independiente y autosuficiente, si no que se conforma por un entramado de calles que se unen a partir de las esquinas (Jacobs, 1961, p. 151). Jacobs plantea que el barrio es, después de la calle, el siguiente nivel donde tienen lugar las interacciones cotidianas que dan lugar a la vitalidad urbana. Estos barrios son "continuidades físicas, sociales, económicas" que forman parte de una red más grande, la del distrito, y en última instancia, la ciudad (Jacobs, 1961, p. 150). Además, Jacobs explica que los barrios tienen una función vital de autogobierno, ya que son responsables de solicitar ayuda en situaciones que superan la capacidad de resolución a nivel de la calle (opus cit.), aunque en algunos casos esta ayuda puede requerir la intervención a niveles superiores, como el de distrito o incluso la ciudad.

3.3. Vitalidad urbana: definición y condiciones

Jacobs introduce un cambio de perspectiva al analizar las ciudades, presentando el concepto de vitalidad urbana. Siguiendo con lo expuesto en el capítulo anterior, la vitalidad urbana puede definirse como una cualidad que tienen los espacios urbanos capaces de atraer una constante presencia e interacción de personas que realizan actividades cotidianas, garantizando la seguridad. Esta vitalidad urbana se genera y se debe analizar en una escala de calle, en primera instancia, aunque también teniendo en cuenta otras escalas mayores como la del barrio, el distrito y la ciudad. En su libro de 1961, Jacobs identifica determinadas características del diseño urbano que hacen que las ciudades acojan esta *vida* en la calle, o de lo contrario, desincentiva la actividad humana y las conducen a su muerte. Estas características se pueden resumir en cuatro condiciones básicas: la *concentración*, la *diversidad*, la *necesidad de edificios antiguos* y la *oportunidad de contacto*. A pesar de que Jacobs presenta estas condiciones en un orden diferente en el libro, aquí se presentarán de manera secuencial para facilitar la comprensión durante la lectura.

La primera condición para la vitalidad urbana es la *concentración*. Aunque se menciona en un momento avanzado del libro como una condición para la vitalidad, la concentración resulta un requisito para que se puedan dar el resto de las condiciones. Según Jacobs es necesario que haya una concentración de actividad humana suficiente, tanto de personas como de actividades, para que haya motivos para usar la calle (Jacobs, 1961, p. 235). Para ello, los

barrios deben tener, en primer lugar, densidad residencial, es decir, una concentración de personas que vivan en ellos y que estén las unas cercas de las otras (opus cit.). Y, en segundo lugar, esta actividad residencial tiene que complementarse con otros usos y actividades cotidianos. Cabe mencionar que Jacobs advierte que no hay que confundir la densidad con el hacinamiento, ya que la primera hace referencia a la concentración de unidades de vivienda en el espacio, y la segunda hace referencia a "demasiada gente dentro de cada vivienda", es decir, a la superpoblación.

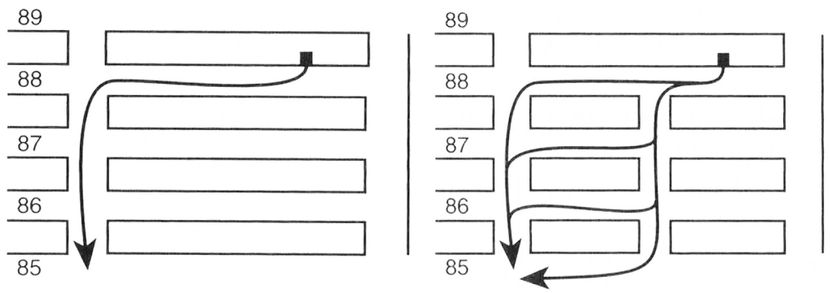
Una vez se alcanzan ciertos niveles de concentración es entonces cuando Jacobs considera que se sientan las bases para producir diversidad, la característica clave de la vitalidad urbana que asegura la seguridad y la interacción. Esta diversidad se genera a partir de la mezcla de usos y de personas. Para lograr la mezcla de usos Jacobs ve necesario contar con una red comercial potente y diversa, que incluya el comercio local y una gran variedad de empresas de productos y servicios. Así, llega a la segunda condición para la vitalidad, la necesidad de *combinar al menos dos usos primarios con otros usos secundarios* (Jacobs, 1961, p. 180). Jacobs se refiere a los usos primarios o diversidad primaria, como aquellos usos que "anclan" a las personas a los sitios (Jacobs, 1961, p. 192), como las oficinas, las viviendas o equipamientos dedicados a la educación o la cultura. La diversidad primaria debe combinarse de manera efectiva con los usos secundarios o diversidad secundaria, es decir, con aquellas actividades que surgen para atender a otras necesidades de las personas que acuden a los usos primarios, como son los servicios y tiendas especializadas (Jacobs, 1961, p. 195).

Esta diversidad comercial y de combinación de usos primarios y secundarios, a su vez, propiciará una diversidad personas que acuden a realizar esta gran variedad de actividades. Para garantizar esta diversidad de personas resulta fundamental cumplir con la tercera condición de la vitalidad urbana, que consiste en *conservar los edificios antiguos* (Jacobs, 1961, p. 221). Según Jacobs, los barrios deben contar con una combinación de edificios de tipologías diferentes para que personas y empresas con distintas capacidades socioeconómicas puedan acceder a la vivienda y emprender un negocio (Jacobs, 1961, p. 223). Para ello, resulta necesario conservar los edificios antiguos, no solamente desde un punto de vista estético, sino refiriéndose a "casas sencillas y de poco valor" (Jacobs, 1961, p. 221), ya que en los edificios nuevos solo pueden instalarse aquellos que puedan afrontar altos gastos.

Finalmente, Jacobs expone una cuarta condición necesaria para la vitalidad urbana, la *oportunidad de contacto*. Para propiciar la interacción social y generar una sensación de seguridad en la ciudad a través de los *ojos en la calle*, Jacobs aboga por un diseño urbano a escala humana. Según su criterio, esto se consigue evitando las manzanas grandes y en su lugar apostando por manzanas estrechas (Jacobs, 1961, p. 211). Las manzanas grandes limitan el número posible de recorridos que las personas pueden realizar para llevar a cabo sus actividades cotidianas, lo que favorece el aislamiento al no haber caminos en común con otras personas. Por el contrario, cuando las manzanas son estrechas, hay un mayor número de intersecciones y, por tanto, aumentan las posibilidades de encontrarse con otras personas y de localizar diferentes comercios (Jacobs, 1961, p. 213) (Figura 4).

A parte de estas condiciones principales, el libro Jacobs identifica otros elementos del entorno construido que tienen un impacto sobre la vitalidad urbana, ya sea fortaleciéndola o debilitándola. Estos elementos podrían resumirse en dos condiciones adicionales, la *accesibilidad* y la *existencia de vacíos fronterizos*.

Figura 4. Comparación del número de rutas posibles cuando las manzanas son anchas (izquierda) vs estrechas (derecha).



Fuente: Jacobs (1961, p.213).

De acuerdo con Jacobs, es esencial que las ciudades vitales cuenten con una red de transporte eficiente y fluida que ofrezca múltiples opciones. Para lograrlo, es necesario disminuir la dependencia del automóvil, ya que la presencia de los coches resulta incompatible con la concentración de usos y personas (Jacobs, 1961, p. 387). Para ello, se deben implementar diseños urbanos que desalienten el tráfico vehicular y fomenten el uso de alternativas de transporte, el transporte público y la movilidad a pie. Estas estrategias incluyen la creación de aceras amplias, la plantación de árboles, la promoción de diversos usos, la instalación frecuente de pasos peatonales, la prohibición de estacionamientos y una planificación del transporte público que sea rápida y frecuente.

A su vez, la vitalidad se ve afectada por la existencia de lo que Jacobs llama como *vacíos fronterizos*. Estos son elementos urbanos que forman extensiones de usos únicos, y cuya presencia hace disminuir la actividad a pie y el uso de la ciudad, suponiendo una barrera en la vida cotidiana de las personas. Un ejemplo recurrente son las infraestructuras de transporte como las vías férreas o las grandes autopistas, que dividen la ciudad física y socialmente. También lo son aquellos centros de un solo uso que ocupan terrenos extensos como los campus universitarios, parques, aparcamientos, hospitales, grandes centros cívicos o museos. En el caso de estos últimos, Jacobs los califica como "bendiciones de doble filo" (Jacobs, 1961, p. 300), ya que son indispensables para la ciudad pero también pueden suponer un vacío de vitalidad, por su uso escaso en comparación con el espacio que ocupan, sobre todo a ciertas horas del día en que se convierten en lugares poco transitados, *lugares muertos* (Jacobs, 1961, p. 299).

Capítulo 4

El legado teórico de Jacobs

Siguiendo la estela de las teorías de Jane Jacobs, otros autores y corrientes posteriores han abordado el estudio de las ciudades desde enfoques teóricos similares, aunque han empleado diferentes conceptos. Pese a que las teorías de Jacobs surgieron en la década de los sesenta, siguen siendo relevantes en la actualidad, ya que se conectan con los nuevos paradigmas teóricos que están marcando la planificación urbana del siglo XXI (Schubert, 2014). También se incorporan nuevas visiones al pensamiento de Jacobs debido a la aparición de fenómenos recientes. En los siguientes apartados, se hará un recorrido por estas corrientes: primero, comenzando por las obras de autores clásicos del urbanismo contemporáneo como William H. Whyte y Kevin Lynch; segundo, pasando por la corriente del *New Urbanism*; y, finalmente, explorando los nuevos impulsos teóricos de la sostenibilidad, el urbanismo feminista y la justicia social que han dado lugar a diferentes políticas urbanas en los últimos años.

4.1. William H. Whyte y la vida social de los pequeños espacios urbanos

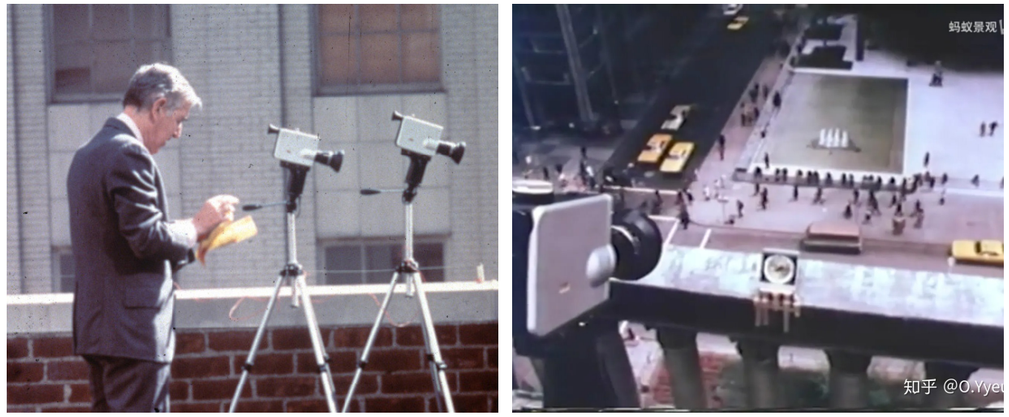
Entre los autores clásicos que han influido en la geografía urbana contemporánea, destaca William H. Whyte (1917-1999), quien fue periodista, editor de revistas y coetáneo de Jane Jacobs. Whyte fue en realidad uno de los que impulsó la publicación de las ideas de Jacobs, pues él mismo la reclutó para que escribiera su artículo debut *Downtown is for People* (1958) en una serie de artículos sobre urbanismo que editó para la revista Fortune, y más adelante la ayudó con la financiación de la escritura de *Muerte y vida de las grandes ciudades americanas* (1961).

Las ideas de Whyte, al igual que las de Jacobs, han sido reconocidas recientemente como fundamentales para la planificación contemporánea (Rein, 2022). Whyte inició su carrera abordando la cultura corporativa en su obra *The Organization Man* (1956), sin embargo, no fue hasta los años setenta cuando decidió enfocarse en el análisis del entorno construido y el paisaje urbano. Un hecho clave en este cambio de enfoque se dio cuando trabajó para la *New York Planning Commission*, que le encargó un plan global para la ciudad, el Plan para la Ciudad de Nueva York (1969), en el que prestó especial atención al diseño de espacios públicos de calidad como parques, aceras y plazas accesibles. Esta colaboración resultó en el proyecto de investigación *The Social Life of Small Urban Spaces* (1980).

En este proyecto se refleja una idea fundamental del enfoque de Jacobs, el hecho proponer un análisis *in situ* para comprender el funcionamiento de los espacios en la vida cotidiana. Whyte también se centra en la calle como el principal espacio público que desempeña un papel fundamental en la vida urbana y en las interacciones sociales. Él se refiere a esto como *vida social* (Whyte, 1980). En particular, el autor muestra un gran interés por los pequeños

espacios públicos, ya que bajo su perspectiva estos tienen un gran impacto en la calidad de vida de las personas. La investigación de Whyte comienza con preguntas sencillas: ¿Por qué ciertos espacios públicos tienen más éxito que otros? ¿Por qué algunos resultan atrayentes y hacen que la gente los use, y otros en cambio están vacíos? (opus cit.). Para responder estas preguntas, al igual que Jacobs, utiliza la observación directa, aunque incorporando una metodología original para su época: la recopilación de material videofotográfico (Figura 5). El vídeo resultó ser una herramienta valiosa para la observación de ambientes, ya que le permitió observar el uso de las plazas y el comportamiento de las personas en los espacios públicos (Brayer, 2013).

Figura 5. (izquierda) William H. Whyte utilizando una cámara de vídeo para recoger datos sobre el uso del espacio público. (derecha) Cámara enfocando a la plaza del Edificio Seagram en Nueva York.



Fuente: (izquierda) Project for Public Spaces. (derecha) Whyte, W. H. (Director). (1980). Social Life of Small Urban Spaces [Documental]. Municipal Art Society of New York.

De manera similar a Jacobs, Whyte identifica ciertos elementos del entorno construido que son generadores de la vida social, como la presencia de sol, árboles, agua, comida y asientos. Sin embargo, señala que estos elementos no tienen por qué ser solo físicos. Whyte también habla de la figura del *mayor* (Whyte, 1980, p. 64), una persona frecuente en plazas y espacios públicos como la seguridad de un edificio, un vendedor de comida o un quiosquero, que supervisa indirectamente estos espacios (lo que Jacobs llamó *ojos en la calle*) y propicia las interacciones sociales. Whyte destaca que estos elementos son los principios básicos para la vida social, ya que permiten crear espacios confortables, aquellos lugares donde las personas se sienten cómodas y seguras.

4.2. Kevin Lynch y la imagen de la ciudad

Kevin Lynch fue un urbanista y arquitecto estadounidense, considerado otro de los autores más relevantes en la teoría urbana del siglo XX. Al igual que Jacobs, también cuestionó los planteamientos de la planificación urbana dominantes en los años sesenta y centraron su análisis en la experiencia humana de vivir en la ciudad, destacando la importancia del diseño en esta experiencia.

Lynch desarrolló una teoría de la forma urbana con un enfoque similar al de Jacobs. Su

principal interés fue entender la percepción visual de las personas en el diseño de la ciudad, y para ello propuso el concepto de legibilidad (en inglés, *legibility*) como variable clave del éxito del espacio público (Lynch, 1960, p. 3). Argumentó que los buenos espacios públicos son aquellos que pueden ser mentalmente proyectados, con una organización espacial fácil de recordar que permita a las personas orientarse fácilmente. En estos espacios, se deben poder identificar cinco elementos clave para la construcción de la imagen de la ciudad (Lynch, 1960, p. 46): los caminos (rutas peatonales), los bordes (límites entre dos áreas), los distritos (áreas con características similares), los nodos (puntos focales) y los hitos (objetos prominentes).

Otro de los focos clave en los que profundiza el pensamiento de Lynch es en entender la experiencia sensorial y emocional de la ciudad, en lugar de limitarse a comprenderla desde su funcionalidad y eficiencia. De manera similar a Jacobs, en su obra *The Good City form* (1981), Lynch propuso una teoría sobre la forma urbana según la cual el diseño urbano tiene que cumplir cinco cualidades para que este sea de calidad. Estas cinco dimensiones están interrelacionadas y deben ser consideradas en conjunto como un marco de evaluación de la calidad del diseño urbano.

La primera condición es la *vitalidad*, que se refiere a la energía vibrante de una ciudad (Lynch, 1981, p. 121). Para ello es necesario contar con una diversidad de actividades y servicios que atraigan a una amplia gama de personas y fomenten la interacción social. La segunda condición es la *comodidad*, que se refiere a que la ciudadanía tenga la sensación de que la ciudad es un espacio agradable para vivir. Esto implica que la ciudad sea segura, limpia y con una amplia oferta de espacios públicos para la recreación. La tercera condición es la *accesibilidad*, que se refiere a que los habitantes puedan acceder fácilmente a una diversidad de lugares, recursos y servicios cotidianas (Lynch, 1981, p. 187). Para ello es necesario una amplia red de transporte, calles con aceras anchas aptas para acoger una gran actividad peatonal y seguras, y la distribución equitativa de los servicios y actividades en la ciudad. La cuarta condición es la *adaptabilidad*, refiriéndose a la capacidad de la ciudad para adaptarse a las necesidades cambiantes de su población residente. Para ello, las infraestructuras y espacios deben tener un diseño flexible que permita su evolución y mejora continua. Finalmente, la quinta condición es la *identidad*, y se refiere a la personalidad distintiva de una ciudad. Esto requiere una arquitectura y un diseño urbano coherente y distintivo respecto a otras ciudades, que refleje la historia, la cultura y los valores de la ciudad y sus habitantes.

Estas ideas presentan enfoques muy similares a los de Jacobs, utilizando conceptos como *vitalidad* y *accesibilidad*, así como otros términos afines para transmitir ideas que en realidad abogan por lo mismo que manifiesta la autora: la necesidad de diseñar ciudades que fomenten la interacción social, que sean seguras, no dependan del transporte privado y cuenten con servicios básicos cercanos a la población residente. Lo que aporta de novedoso es la inclusión de elementos como la *identidad*, el *sentido de pertenencia* a un lugar y la *adaptabilidad* de los espacios a las necesidades actuales, como factores que refuerzan la vitalidad de las calles.

4.3. El New Urbanism

El legado más evidente de las teorías de Jane Jacobs, sin duda, se refleja en la corriente del New Urbanism. Se trata de un paradigma de pensamiento urbano impulsado por un grupo de arquitectos y urbanistas que surgió a principios de los años ochenta en Estados Unidos como respuesta a los problemas creados por el modelo urbano desarrollado en el país durante la

segunda mitad del siglo XX. Este movimiento nace como una crítica al desarrollo suburbano de la época, al diseño basado en la dispersión urbana y la dependencia del automóvil, y a la organización social que propone como resultado de este diseño (Al Hindi, 2001).

Desde el *New Urbanism*, se denuncia que la suburbanización propia del desarrollo norteamericano construye entornos de usos únicos, donde las funciones urbanas están separadas en el espacio y donde se promueve una arquitectura homogénea (opus cit.). Este modelo de desarrollo se considera problemático porque repele la actividad peatonal y segrega también a la población en barrios que acogen a residentes con perfiles socioeconómicos similares. De esta manera, se dificulta la interacción humana y la generación de relaciones sociales que puedan dar lugar a una verdadera comunidad urbana y a barrios vibrantes (Katz, 1994; Putnam, 2000).

En oposición a este modelo de desarrollo, el *New Urbanism*, inspirado en las teorías de la vitalidad urbana de Jacobs, destaca la importancia de la diversidad y las interacciones entre la actividad humanas y el espacio urbano para crear entornos atractivos que acojan una población diversa. Para ello recuperan la idea de Jacobs del barrio[1] como unidad fundamental para el desarrollo de la vida cotidiana, y aboga por el diseño de comunidades compactas, de uso mixto, peatonales y relativamente autosuficientes (Congress for the New Urbanism, 2001; Duany & Plater-Zyberk, 1994). El New Urbanism busca inspiración en el pasado urbano, anterior a las teorías urbanas modernas, reviviendo las tramas tradicionales de ciudades medievales y coloniales, y aprovechando las lecciones históricas de ciudades europeas exitosas cuyas formas urbanas facilitan el caminar y la creación de identidades y comunidades sólidas.

Más allá de sus principios teóricos, el *New Urbanism* se ha convertido en parte del discurso y práctica del urbanismo contemporáneo, y ha sido adoptado en las políticas urbanas de las últimas décadas (Grant, 2006). Su mayor influencia ha sido en el planeamiento de Estados Unidos y Canadá (Katz, 1994), donde se han utilizado las directrices del *Congress for the New Urbanism* para revertir algunos desarrollos de zonificación y de crecimiento suburbano (Njoh, 2009). También ha influido en Europa, donde el *New Urbanism* ha adoptado sus propios enfoques (Grant, 2006, p. 105). A pesar de que los principios del *New Urbanism* se basaron en las ciudades europeas, durante la segunda mitad del siglo XX, sus centros históricos sufrieron un declive al mismo tiempo que se instauraba el modelo segregado y centrado en el automóvil de la ciudad moderna. En este contexto, se adoptaron soluciones diversas, como la renovación del patrimonio edificado para revitalizar las áreas antiguas y encontrar nuevos usos para los edificios históricos (Couch et al., 2003), la iniciativa de ciudades que han convertido las calles centrales en zonas peatonales (Topp & Pharoah, 1994), o la creación de villas urbanas (Biddulph et al., 2003).

4.4. El paradigma de la sostenibilidad: de la ciudad segregada a la ciudad de la proximidad

El paradigma de la sostenibilidad se conforma a finales de los años ochenta y principios de los noventa, en un contexto de amenaza climática global e impulsado por los compromisos de planes de acción globales liderados por instituciones mundiales, como el *Informe Brundtland*

1 El barrio se define como el espacio circunscrito en cinco minutos a pie (Duany & Plater-Zyberk, 1994).

(United Nations, 1987) y la *Agenda 21* (United Nations, 1992). Este paradigma defiende que el planeamiento urbano debe tener en cuenta las consecuencias ambientales y sociales del sistema urbano, de manera que se satisfagan las necesidades presentes sin comprometer la capacidad de las futuras generaciones para satisfacer sus propias necesidades (United Nations, 1987, p. 24). Esto supone un cambio significativo en el enfoque del desarrollo urbano y en el análisis de la ciudad.

La promoción de entornos sostenibles se centra principalmente en la relación clave entre la forma urbana y la movilidad. En el estudio de esta relación resultan clave las aportaciones empíricas que muestran como las características del entorno construido conllevan al uso de determinados modos de transporte (Ewing & Cervero, 2010; Handy et al., 2002). Así, una organización urbana propia de la ciudad moderna y funcionalista, basada en una estructura urbana de baja densidad, la separación de usos, pocas intersecciones y baja conectividad, resulta en largas distancias que conllevan la dependencia del automóvil como medio de transporte principal. Este modelo urbano disperso se ha considerado globalmente como agotado debido a sus altos costes ambientales y sociales (European Comission, 2011). Son precisamente los argumentos 1) del alto consumo energético y 2) de la pérdida de calidad de vida que suponen el modelo de movilidad motorizado lo que hacen recuperan la idea de ciudad compacta (Breheny, 1995). Así, en las últimas décadas, ha habido un cambio hacia el desarrollo de ciudades más compactas, diversas, transitables, orientadas al transporte público y la movilidad activa. Ciudades cuya sostenibilidad se basa en la contención de la urbanización y en donde la densidad pasa a ser un valor urbano positivo (Miralles-Guasch, 2002).

De esta manera, la promoción de la sostenibilidad en las ciudades retoma las condiciones que Jacobs propuso como catalizadores de la vitalidad urbana. No obstante, el concepto clave que ha ganado relevancia en los últimos años desde el urbanismo desde el paradigma de la sostenibilidad es el de la *proximidad*. Se ha producido un cambio de visión en la planificación de las ciudades, el *accessibility turn*, pasando de un enfoque basado en la movilidad y el transporte a otro basado en la accesibilidad a los usos y servicios urbanos (Curtis & Scheurer, 2010). En este sentido, la proximidad, entendida como la cercanía geográfica y temporal, se ha convertido en una característica urbana fundamental que guía la planificación para resolver algunos de los problemas ambientales y sociales actuales, invirtiendo en la cercanía geográfica, los desplazamientos cortos y la planificación espacial.

En cuanto a los beneficios de la proximidad, se ha evidenciado principalmente su impacto positivo en el ámbito ambiental. El sector del transporte es el principal responsable de la contaminación ambiental, ya que en la mayoría de los países desarrollados la energía proviene de combustibles fósiles (Odyssee-Mure, 2021). En este sentido, los entornos de proximidad acercan los puntos donde se encuentran las diferentes actividades cotidianas, y por tanto permiten satisfacerlas usando los modos de transporte de la movilidad activa, desincentivando el uso del automóvil, ergo disminuyendo las emisiones contaminantes. Sin embargo, en los últimos años, se ha reivindicado la proximidad por los beneficios que aporta desde el punto de vista de la sostenibilidad social. La forma urbana de los entornos de proximidad se ha considerado como una manera de promover la calidad de vida y la equidad urbana (Banister, 2008). Estos entornos se perciben como más saludables, ya que promueven estilos de vida con mayores niveles de actividad física y una mayor calidad del aire debido a la menor presencia de vehículos privados. Además, se consideran más equitativos, ya que permiten satisfacer las necesidades cotidianas a pie, el modo de transporte más democrático, cuando los entornos ofrecen una diversidad de equipamientos y servicios equitativamente distribuidos por el territorio (Gunn et al., 2017; Lo & Houston, 2018; Marquet & Miralles-Guasch, 2015). Sobre

esta cuestión de la equidad social profundizaremos en el siguiente apartado.

Existen varios ejemplos de iniciativas en diferentes partes del mundo que, bajo la premisa de la sostenibilidad, apuestan por ciudades de proximidad que promueven las condiciones de la vitalidad urbana. Un ejemplo es el programa *Complete Streets* en Estados Unidos, que se implementa desde la primera década de los dos mil y busca revertir el diseño centrado en vehículos motorizados de las calles, para crear calles inclusivas, accesibles y seguras para todos los usuarios, mejorando en particular las condiciones para los peatones y ciclistas (La Plante & McCann, 2008; Smart Growth America & National Complete Streets Coalition, 2016). Un ejemplo más reciente es el enfoque del *cronourbanismo*, el cual se encuentra en las iniciativas de las *X-minute-cities*, que se basan en una planificación urbana que brinda acceso a los servicios y actividades diarias en un rango de minutos determinado, dependiendo del contexto urbano. Por ejemplo, en ciudades como Portland y Melbourne se utiliza la medida de 20 minutos (City of Portland Bureau of Planning and Sustainability, 2012; Victoria State Government, 2020), mientras que en ciudades europeas como París y Barcelona, el objetivo es convertirse en ciudades del cuarto de hora (Moreno et al., 2021).

4.5. El urbanismo con perspectiva de género – de la ciudad patriarcal a la ciudad de los cuidados

Desde los estudios de género surge otra perspectiva a la hora de abordar la sostenibilidad, aquella que se relaciona con las tareas reproductivas y de cuidado que hacen posible la *sostenibilidad de la vida* (Pérez Orozco, 2015). Este enfoque se ha impulsado desde el ámbito académico, gracias a las contribuciones de autoras que, a partir de los años setenta y hasta día de hoy, y desde disciplinas diversas como la sociología, la geografía, y la arquitectura, han investigado la relación entre los entornos urbanos y el género (Bofill, 2007; Bondi & Rose, 2003; Hanson & Pratt, 1995; McDowell, 1997; Miralles-Guasch, 1998; Monk & García Ramón, 1987; Muxí, 2018; Rodó-de-Zárate & Baylina, 2018; Rosenbloom, 1978; Spain, 2014). Sin embargo, el salto de estos planteamientos al debate público y a las instituciones encargadas del desarrollo urbano es reciente, reconociendo la igualdad de género y la autonomía de las mujeres como factores fundamentales para avanzar hacia el desarrollo sostenible (United Nations, 2015).

A pesar de que Jane Jacobs no se autodenominó como teórica feminista, sus ideas han sido una referencia clave para los estudios de género (Col·lectiu Punt 6, 2019, p. 33). La crítica de Jacobs a la ciudad moderna y su forma de producir conocimiento sobre la ciudad, desde la experiencia, en realidad, suponen una reivindicación de la vida cotidiana. Así, el uso de la vida cotidiana como objeto de análisis y método de estudio es precisamente el punto de partida y la conexión entre las teorías de Jane Jacobs y el urbanismo con perspectiva de género o urbanismo feminista[2] (Comas, 2017; Horelli & Vepsä, 1994; Horelli & Wallin, 2013).

2 En el libro *Urbansimo feminista. Por una transformación radical de los espacios de vida* (2019), la autoras de Col·lectiu Punt 6 puntualizan que el urbanismo con perspectiva de género se refiere a la incorporación del género como variable de análisis para estudiar las desigualdades asociadas a la construcción social del género, mientras que el urbanismo feminista supone un posicionamiento político que propone una nueva organización social que cuestiona el urbanismo patriarcal (Col·lectiu Punt 6, 2019, p. 20).

Este enfoque de género del urbanismo denuncia que el desarrollo y estudio de las ciudades, lejos de ser neutral, se realiza dentro del marco de una organización social patriarcal, bajo un prisma androcéntrico que privilegia las tareas productivas, asociadas al mundo masculino, y desvaloriza las tareas reproductivas, cuya responsabilidad recae principalmente en las mujeres en forma de trabajo no remunerado (Bimbi, 1995; Carrasco et al., 2011). Este fenómeno se conoce como división sexual del trabajo y hace que las tareas cotidianas sean diferentes para hombres y mujeres, afectando también el uso de los espacios urbanos en función del género (Durán Heras, 2008). Así, esta desigualdad del sistema patriarcal se ve reflejada en la organización de los espacios segregados de la ciudad moderna, que prioriza la esfera productiva como prioridad en el espacio público y relega lo reproductivo a la esfera privada (Hayden, 1981).

Un claro reflejo de ello se observa en el sistema de movilidad urbana, diseñado para satisfacer las necesidades del trabajo productivo, dándole mayor relevancia a la movilidad laboral (en inglés, *commuting*), y relegando a un segundo plano las movilidades cotidianas vinculadas a la esfera reproductiva (Coutras, 1993, 1997; Miralles-Guasch, 1998, 2010; Sánchez de Madariaga, 2013). Esto se traduce, entre sus consecuencias principales, en que las mujeres asumen mayores tiempos de desplazamiento, o en un reparto desigual del espacio público que privilegia el uso del automóvil, que es sobre todo masculino, en detrimento del resto de modos de transporte. De esta manera, al centrar el foco del análisis en la actividad cotidiana de la calle, sus usos y su actividad peatonal, implica enfocarse en las movilidades y usos cotidianos más allá de los protagonizados por la figura del hombre *breadwinner*[3] que se toma como experiencia universal, como los de las mujeres, los niños/as y otros colectivos con menor representación en la toma de decisiones urbanas (Akinci et al., 2021; Jirón & Imilán, 2018; Prats Ferret et al., 2012). Además, el uso de la experiencia cotidiana como metodología es útil para comprender los aspectos subjetivos que influyen a la hora de utilizar los espacios urbanos (Sharp, 2005). En el caso de las mujeres, por ejemplo, la percepción de seguridad resulta muy relevante, ya que el miedo a sufrir violencia machista condiciona la movilidad y el uso de la ciudad (Day, 1999; Warren, 2017).

El urbanismo feminista busca revertir estas desigualdades situando la vida cotidiana como principio clave de la planificación urbana (Col·lectiu Punt 6, 2019, p. 78). Para ello, se aboga por promover diseños urbanos que combinen la compacidad, la diversidad de usos y la proximidad. Esto hará que los barrios sean seguros, ya que se fomenta la presencia de *ojos en la calle* y, al mismo tiempo, permiten llevar a cabo las tareas cotidianas, incluyendo las de cuidado. En realidad, estas condiciones son las mismas que defendía Jacobs en su modelo de ciudad vital y también contribuyen a abordar la sostenibilidad urbana (Hanson, 2010; Miralles-Guasch, 1998).

El enfoque del urbanismo feminista sigue también la estela de Jacobs en el sentido de que pretende revertir la forma en que se piensa, diseña y analiza la ciudad, tomando en cuenta la variable de género en intersección con otras variables que son penalizadas por el sistema patriarcal (como la edad, la orientación sexual, el origen, la dependencia o la clase social) (Kern, 2021, p. 24). La ciudad funcionalista, por su parte, se basa en una experiencia universal de la ciudad centrada en la cotidianidad propia del hombre arquetipo *breadwinner*, lo que lleva a una lógica simplista en la organización de los usos urbanos y a la fragmentación entre lo productivo y lo reproductivo. En cambio, el urbanismo con perspectiva de género recupera

3 El término inglés breadwinner hace referencia a la persona que proporciona el sostén económico del hogar familiar.

la idea de complejidad de Jacobs, reconociendo la diversidad de tareas que se llevan a cabo en la vida cotidiana por una variedad de sujetos con necesidades distintas (Col·lectiu Punt 6, 2019).

En los últimos años encontramos una propuesta innovadora a la hora de planificar ciudades desde la perspectiva de género: la promoción de ciudades cuidadoras (Chinchilla, 2020; Valdivia, 2018). Se reconoce que la esfera urbana juega un rol fundamental en la manera en que se llevan a cabo las tareas del cuidado, ya que son los escenarios donde llevamos a cabo nuestras actividades cotidianas (Segovia, 2018). Así, en tanto que el cuidado se considera de interés público, ergo, hay que corresponsabilizarse socialmente de ello, las ciudades deberían proporcionar los soportes físicos adecuados para satisfacer las necesidades de cuidado (Williams, 2020). En este sentido, encontramos iniciativas pioneras en Latinoamérica, donde se ha desplegado un Plan Nacional de Cuidados que pretende garantizar la cobertura de cuidados a personas con dependencia (Junta Nacional de Cuidados, 2015). Este se concreta a nivel urbano a través de políticas municipales que dotan los barrios de servicios de cuidado y también actuaciones en el espacio público relativas al diseño para mejorar la accesibilidad peatonal y la confortabilidad del espacio público, como en el caso de los *Polígonos de cuidados* en Montevideo (Gobierno de Montevideo, 2022) o las *Manzanas del cuidado* en Bogotá (Gobierno de Bogotá, 2021). Estas propuestas también han dado el salto a nivel nacional, ciudades como Barcelona, Madrid y Valencia han expresado su ambición de transformarse en ciudades cuidadoras y con este objetivo están promoviendo cambios en el espacio público para mejorar la movilidad cotidiana al mismo tiempo que programas de apoyo a las personas cuidadoras (Ajuntament de Barcelona, 2017b; Ayuntamiento de Madrid, 2017; Ciutat Cuidadora, 2019).

4.6. El enfoque de la justicia social – de la ciudad global desigual al derecho a la ciudad

Durante la década de los noventa, se desarrolló un enfoque centrado en la justicia social que tuvo su origen en el malestar social generado por el modelo económico neoliberal y el proceso de globalización. Este enfoque fue impulsado gracias a las aportaciones de varios autores dedicados al estudio de la cuestión urbana procedentes de disciplinas como la sociología y la geografía económica, y recibió el apoyo de los movimientos de protesta antiglobalización[4], que influenciaron el debate público y ejercieron presión para que se adoptaran políticas más equitativas.

Bajo este enforque aparece el concepto de *ciudad global*. Una de las primeras autoras en abordar este concepto es Saskia Sassen (Sassen, 1991), quien sostiene que, gracias a la globalización económica y la liberalización de los mercados, en las ciudades se ha venido produciendo una concentración de poder y riqueza sin precedentes en manos de actores globales como empresas transnacionales, instituciones financieras y políticas. En estas ciudades globales, se producen y se consumen bienes y servicios de un alto valor añadido, de manera que tienen un gran peso la economía del conocimiento, de las economías de la información, las industrias creativas y/o el turismo (opus cit.).

En paralelo a esta acumulación de capital, la globalización económica también ha hecho

4 Una de sus manifestaciones más conocidas del movimiento antiglobalización fueron las protestas contra la Organización Mundial del Comercio en Seattle en 1999.

surgir una creciente desigualdad y exclusión social, provocando una polarización entre ricos y pobres (Harvey, 2007; Sassen, 2016). Estas desigualdades se manifiestan en los espacios urbanos, también allí donde se dan las condiciones de vitalidad urbana defendidas Jacobs. Las economías de la ciudad global han fomentado la revitalización de los centros urbanos densos, convirtiéndolos en áreas atractivas debido a su alta concentración de servicios, diversidad de actividades y accesibilidad (opus cit.). En el contexto específico de las ciudades mediterráneas, cabe destacar el papel clave del turismo como estrategia para el desarrollo económico, que ha resultado fundamental para impulsar estas políticas orientadas a mejorar los barrios urbanos tradicionales (Arbaci & Tapada-Berteli, 2012).

Sin embargo, la paradoja es que el esperado resurgimiento urbano, en oposición del modelo agotado de la suburbanización, se ha convertido en una nueva crisis urbana (Florida, 2017, p. 3). La alta demanda y presión sobre estas áreas ha aumentado el valor del suelo y han dado lugar a la especulación (Stein, 2019, p. 29), provocando fenómenos como la gentrificación y la expulsión de residentes de bajos ingresos de los centros urbanos, la segregación social y la vulnerabilidad urbana (Gravari-Barbas, 2017; N. Smith, 2002). En ciudades turísticas, estos fenómenos se explican por la especialización de ciertos espacios urbanos en lo que la literatura denomina como la *economía del visitante* (C. Law, 2002). Es decir, en la concentración de actividades económicas que implican la transformación del espacio urbano desde el punto de vista físico y simbólico para atraer a las personas visitantes de la ciudad. Esta transformación se produce a través de la competencia por la vivienda, ya que la accesibilidad y disponibilidad de la vivienda se ven comprometidas cuando las unidades habitacionales se convierten en alquileres vacacionales, resultando en la expulsión de la población residente de sus barrios (Nieuwland & van Melik, 2020).

Desde esta perspectiva, a diferencia de los enfoques previos, que adoptan las ideas de Jane Jacobs sobre las condiciones de vitalidad urbana y las consideran como atributos positivos para el bienestar cotidiano per se, se reconoce que la ciudad contemporánea del siglo XXI se enfrenta a nuevos fenómenos que amenazan la vitalidad, la diversidad y la vida cotidiana de los barrios (Massey, 2005). Un ejemplo de esta paradoja es el barrio donde vivía la propia Jacobs, Greenwich Village, que ha sido uno de los primeros en experimentar la gentrificación en la ciudad Nueva York (Sassen, 1991, p. 261). Este proceso tiene consecuencias preocupantes, como la reducción de la diversidad poblacional por la substitución de los residentes por otros de un perfil homogéneo o población flotante (Carvalho et al., 2019; López-Gay et al., 2021), o la modificación del paisaje comercial (Bantman-Masum, 2020; Chang & Spierings, 2023; Friesenecker & Lagendijk, 2021), lo que provoca la destrucción de las redes de confianza que antes existían en el barrio (Sánchez-Ledesma et al., 2020), entre otras consecuencias.

Por lo tanto, en la ciudad global, el estudio de la vitalidad se inscribe en un contexto lleno de tensiones generadas por estas nuevas dinámicas globales en el espacio. El desafío radica en promover entornos vitales y accesibles que no sean excluyentes entendiendo que, estos, a su vez, se convertirán en lugares más atractivos. Algunos autores argumentan que esta es una preocupación compartida por la propia Jacobs, quien afirmaba que los espacios debían ser diseñados considerando la preservación de las relaciones sociales, de manera que se identifica una relación entre sus teorías y los nuevos enfoques teóricos entorno a la justicia urbana (Connolly, 2018).

Bajo este marco teórico, en los últimos años se ha recuperado el concepto del *derecho a la ciudad* desarrollado por Henri Lefebvre en los años sesenta (Lefebvre, 1968). Esta propuesta defiende el derecho no solo a la provisión de servicios básicos, sino también al acceso a una

vida urbana de calidad, donde sea posible el encuentro y el intercambio, el uso del tiempo y de los espacios públicos (Lefebvre, 1996, p. 178). A su vez, esta idea se refiere al derecho de todas las personas a participar activamente en la construcción y transformación de la ciudad, destacando la necesidad de reestructurar las relaciones de poder subyacentes en la producción del espacio urbano, y evitando que los actores globales que influyen en las políticas urbanas excluyan a la ciudadanía de las decisiones que dan forma a sus ciudades (Harvey, 2013). En esta línea de pensamiento surge también la propuesta de *La Ciudad Justa* (en inglés, *The Just City*), que considera que la justicia debe instaurarse en dos direcciones. Primero, la justicia como proceso, de manera que las decisiones urbanas se tomen de manera democrática y fomentando la diversidad de voces (Fainstein, 2010). Y segundo, la justicia como resultado, donde las políticas de inversión pública y regulación del espacio urbano produzcan mejoras equitativas en lugar de apoyar a aquellos que ya tienen una posición privilegiada (opus cit.).

En este sentido, son diversas las iniciativas urbanas que promueven el derecho a la ciudad, combatiendo la mercantilización del espacio público y dando voz a sectores históricamente invisibilizados por la planificación urbana. Estas iniciativas provienen tanto de iniciativas ciudadanas como desde las instituciones públicas. Por un lado, encontramos numerosos ejemplos de movimientos sociales y proyectos ciudadanos a nivel local que buscan recuperar o construir espacios públicos donde se fomente la vida comunitaria. Por otro lado, se identifican una variedad de políticas públicas que persiguen el objetivo de garantizar el derecho a la ciudad, aunque en algunos casos no lo manifiesten de manera explícita. Ejemplos de esto son los presupuestos participativos y los planes estratégicos que mejoran las condiciones de los barrios más marginales en términos de vivienda, vida comunitaria y salud.

Capítulo 5

El estudio de la vitalidad urbana desde una perspectiva aplicada

Si bien Jane Jacobs definió en los años sesenta las condiciones teóricas para albergar barrios vitales a través de la observación cotidiana, hoy en día disponemos de nuevas herramientas, como los Sistemas de Información Geográfica (SIG), y nuevos datos que permiten poner a prueba estos principios a través de su sistematización y análisis espacial. De esta manera, encontramos en los últimos años un número creciente de investigaciones que utilizan estos principios desde una perspectiva aplicada para analizar las ciudades actuales (J. gang Shi et al., 2019). Estos estudios provienen de diversas disciplinas y contextos geográficos, y emplean diferentes metodologías y escalas.

La mayoría de los estudios sobre vitalidad urbana han empleado metodologías cuantitativas y espaciales, a través de la construcción de índices sintéticos que cuantifican los principios de vitalidad, o bien estudiando la relación entre las características físicas de la vitalidad y otras variables de interés relacionadas con la vida cotidiana. En los siguientes subapartados se hará un repaso detallado de la investigación llevada a cabo bajo estos dos enfoques de análisis. Sin embargo, existe una falta de estudios que aborden este concepto desde una perspectiva cualitativa, siendo esta una de las brechas de investigación para la comprensión de la vitalidad y su impacto en la calidad de vida de las personas que habitan las ciudades.

En cuanto a los contextos en los que se han aplicado estos estudios, a pesar de que encontramos estudios de geografías variadas, detectamos que hasta la fecha la mayor parte de literatura aplicada se encuentra en contextos de ciudades de relativa nueva creación que han experimentado un crecimiento masivo en el último siglo, como en el contexto asiático (Q. He et al., 2018; Jin et al., 2017; C. Kang et al., 2020; Long & Huang, 2019; Lu et al., 2019; Lv et al., 2022; H. Sung et al., 2015; C. Wu et al., 2018; J. Wu et al., 2018; Xia et al., 2020; X. Xu et al., 2018; W. Yue et al., 2021; Zeng et al., 2018; J. Zhang et al., 2018), o en formas urbanas donde la suburbanización está muy presente como en ciudades norteamericanas (Anderson et al., 2012; Braun & Malizia, 2015; Humphrey et al., 2017; King, 2013; March et al., 2012, 2012) y latinoamericanas (Barbosa & Baptista Neto, 2015; Faria et al., 2012; Fuentes et al., 2020; Shake, 2015). Sin embargo, existe una menor cantidad de evidencias provenientes de ciudades con entornos construidos con una larga tradición urbana, como es el caso de la ciudad mediterránea (De Nadai et al., 2016; Delclòs-Alió et al., 2019; Delclòs-Alió & Miralles-Guasch, 2018b).

Además, también se identifican limitaciones en la literatura en cuanto a la diversidad de contextos urbanos y escalas utilizadas en los análisis. La mayoría de estos estudios examinan la vitalidad en ciudades centrales, empleando o bien una escala macro de la ciudad con datos altamente agregados (Guan & Rowe, 2016; Q. He et al., 2018; Jin et al., 2017; Khalili & Nayyeri Fallah, 2018; H. Sung et al., 2015; C. Wu et al., 2018) o bien una escala micro muy específica, basada en datos a nivel de punto o calle (Barbosa & Baptista Neto, 2015; March et al., 2012;

X. Xu et al., 2018; J. Zhang et al., 2018). No obstante, existe una falta de investigaciones que puedan analizar la vitalidad considerando el juego de escalas propuesto por Jacobs para comprenderla de manera más completa.

5.1. Operativización de la vitalidad urbana a través de los índices espaciales

En la investigación aplicada sobre las teorías de Jane Jacobs, encontramos un grupo de estudios que aplican los principios de Jacobs para caracterizar las ciudades actuales mediante índices sintéticos, basados en conceptos como la vitalidad o la diversidad urbana. Para ello, han intentado operativizar las condiciones teóricas para la vitalidad (concentración, diversidad, oportunidad de contacto, accesibilidad, entre otras) en variables georreferenciadas concretas.

La mayoría de estos estudios han tomado como referencia teórica los principios originales de Jacobs y, a partir de ellos, han seleccionado variables que han utilizado como proxy para su medición. Para medir la condición de concentración, se han utilizado indicadores clásicos para medir la densidad de personas, como la densidad de población (De Nadai et al., 2016; Delclòs-Alió & Miralles-Guasch, 2018b; Q. He et al., 2018; H. Sung et al., 2015), la densidad residencial (Yoon & Park, 2018) o la densidad de viviendas (Faria et al., 2013; Lu et al., 2019; Y. Yue et al., 2017). Estos datos se han recogido en una escala macro, de ciudad, y meso, a nivel de barrio o de edificio. También se han utilizado variables para medir la densidad de actividades, utilizando nuevos datos georreferenciados disponibles sobre puntos de interés (los *POI*, del inglés *point of interest*) (Q. He et al., 2018; C. Kang et al., 2020; Li et al., 2021; Lu et al., 2019; C. Wu et al., 2018; Y. Yue et al., 2017), equipamientos públicos y actividades comerciales (Long & Huang, 2019). Lo novedoso de los estudios que incorporan este tipo de variables es que estos datos son en forma de puntos, lo que permite analizar la concentración de actividades a escala micro, en un nivel de calle. Para medir la condición de diversidad, se han utilizado diversos índices de entropía sobre usos del suelo a escala de ciudad. También se han empleado índices de diversidad de tipos de edificios a escala meso y, micro, en el nivel de calle, se han aplicado la misma lógica de los índices de entropía para medir la diversidad de actividades (Delclòs-Alió & Miralles-Guasch, 2018b; H. Sung et al., 2015). En cuanto a la oportunidad de contacto, se ha utilizado la red viaria para calcular la densidad de intersecciones (Long & Huang, 2019; C. Wu et al., 2018), que se ha empleado como proxy para valorar la disponibilidad de rutas alternativas en la trama urbana y de puntos de confluencia entre dos calles que propician el encuentro con otras personas. Para medir las condiciones de accesibilidad (H. Sung et al., 2015), los estudios han utilizado principalmente medidas de disponibilidad del transporte público y de la disposición de un entorno caminable teniendo en cuenta condiciones como el estado del pavimento y la presencia de entornos peatonales (Faria et al., 2013; Lunecke & Mora, 2018; H. G. Sung et al., 2013). Finalmente, se ha incorporado la presencia de elementos de frontera que tienen un efecto negativo en la vitalidad, como los espacios monofuncionales y las infraestructuras de transporte (De Nadai et al., 2016; H. Sung et al., 2015).

Dentro de este tipo de estudios que utiliza índices sintéticos para medir las condiciones de la vitalidad urbana, encontramos algunos autores que han tratado de reinterpretar y adaptar la medición de estas condiciones a las realidades urbanas actuales. Esto se ha vuelto posible, en parte, gracias al aumento de producción y disponibilidad de datos georreferenciados en abierto. Encontramos nuevas variables para medir el potencial de los espacios urbanos para acoger una vida de calle intensa. Estas se enfocan en microelementos del diseño de la ciudad, como el mobiliario urbano (presencia de bancos, asientos, lavabos públicos…), la iluminación, la pendiente o el ancho de las aceras (X. Xu et al., 2018). También encontramos autores que adaptan los principios de Jacobs a contextos específicos, como la ciudad mediterránea, donde se utilizan los pequeños parques y plazas como foros de interacción social (De Nadai et al., 2016). Además, algunos autores sugieren que la vitalidad urbana también tiene un componente virtual debido a la creciente importancia del espacio virtual en la vida cotidiana, que a su vez depende de un espacio físico preexistente (Y. L. Kim, 2018). Por lo tanto, se incorpora como variable potenciadora de la vitalidad la existencia de puntos de acceso a internet inalámbrico (puntos de conexión inalámbrica "*wifi*"), como fuente de interacción humana. Finalmente, bajo la perspectiva de la justicia social, algunos autores proponen nuevas variables para medir la diversidad en ciudades con dinámicas globales. Por ejemplo, se incorpora un indicador de asequibilidad de la vivienda como el precio del alquiler para medir la diversidad socioeconómica de la población residente (Li et al., 2021), y un indicador de la proporción de tiendas de grandes cadenas para medir la diversidad comercial y su relación con la gentrificación (Yoon & Park, 2018).

5.2. El estudio de la vitalidad urbana en relación con diferentes variables

Un segundo grupo de estudios sobre la vitalidad urbana son aquellos que utilizan los principios de Jacobs con el objetivo de comprender cómo se relacionan las condiciones para la vitalidad urbana con variables específicas en diferentes ámbitos académicos.

Probablemente la mayor parte de producción académica de este tipo de estudios proviene del campo de la movilidad. La actividad peatonal se toma recurrentemente como indicador de la presencia humana y, por lo tanto, como un indicador para medir la vitalidad. En este sentido, se identifican estudios que analizan los flujos peatonales, principalmente utilizando métodos cuantitativos, exceptuando algunas excepciones (Barbosa & Baptista Neto, 2015). Estos estudios emplean diversas metodologías en su recolección de datos, desde las formas más tradicionales, como el conteo de personas (Lunecke & Mora, 2018) o las encuestas de movilidad cotidiana (Marquet & Miralles-Guasch, 2016), a datos georreferenciados producidos en el seguimiento de rutas (en inglés, la metodología *tracking*) (Delclòs-Alió et al., 2019), datos que provienen de teléfonos móviles (De Nadai et al., 2016; Sulis et al., 2018; H. G. Sung et al., 2013) y datos de redes sociales (C. Wu et al., 2018). A su vez, algunos autores sugieren que la vitalidad, entendida como actividad peatonal, presenta diferencias dependiendo de la hora del día (X. Xu et al., 2018).

La seguridad ha sido otro ámbito que ha sido explorado en la investigación académica sobre vitalidad urbana. Los estudios parten de la idea de *ojos en la calle*, refiriéndose a la sensación de seguridad de los espacios públicos por la presencia de otras personas que establecen un sistema de vigilancia informal. Se identifican artículos que exploran la relación espacial entre las características urbanas definidas por Jacobs y datos sobre seguridad, por ejemplo, utilizando tasas de delincuencia (Anderson et al., 2012; Faria et al., 2013; Humphrey et al., 2017), o datos cualitativos sobre la inseguridad del entorno construido recogidos mediante los sistemas de información geográfica (Shach-Pinsly, 2019). Esta relación entre seguridad y vitalidad también ha sido relevante para los estudios que incorporan la perspectiva de género. Algunos autores han evidenciado, desde una perspectiva cualitativa, que los entornos donde existe una mayor accesibilidad a servicios de proximidad y funciones de uso mixto, fomentan el uso del espacio público por parte de las mujeres (Khalili & Nayyeri Fallah, 2018; van den Berg, 2018).

Las ideas de Jane Jacobs sobre la vitalidad urbana también están siendo utilizadas para analizar la relación con las dinámicas comerciales actuales. Por un lado, se encuentran estudios que emplean datos de transacciones bancarias para evidenciar que las condiciones de vitalidad, especialmente cuando existe una mayor accesibilidad peatonal, se traducen en un aumento de las ventas comerciales (Yoshimura, Santi, et al., 2021; Yoshimura et al., 2022). Otros estudios utilizan datos georreferenciados de la actividad comercial y establecen relaciones entre estas condiciones y la ubicación de diferentes tipos de comercio alimentario (Gómez-Varo et al., 2021). Además, se han realizado investigaciones sobre la diversidad comercial en relación a otras condiciones de vitalidad, como la accesibilidad. Por ejemplo, Kumakoshi et al. (2021) revela que una mayor accesibilidad al transporte público no siempre se traduce en una mayor diversidad comercial. También se han encontrado estudios que exploran la relación entre las condiciones de vitalidad urbana y el fenómeno de la gentrificación comercial. Yoon & Park (2018), a través de registros fotográficos de tiendas y datos sobre su uso y tamaño físico, observaron que se está produciendo una sustitución de los comercios locales tradicionales.

Por último, también encontramos autores que abordan el vínculo entre las condiciones de vitalidad urbana y el fenómeno de la gentrificación, aunque desde perspectivas diferentes. Estos autores advierten que las condiciones de vitalidad pueden promover paradojalmente dinámicas que desplazan a grupos poblacionales específicos de sus vecindarios (Kirby, 2018; van den Berg, 2018). Existen estudios que se refieren a la gentrificación verde, la cual evidencia que la presencia de parques urbanos y áreas verdes que funcionan como espacios de encuentro está ocasionando la sustitución de la población, homogeneizándola en determinadas clases sociales y excluyendo a aquellas personas de bajos ingresos (Anguelovski et al., 2018; Connolly, 2018).

PARTE III:

METODOLOGÍA

Capítulo 6

Diseño de la investigación y visión general

Esta tesis doctoral se centra en el estudio aplicado de la vitalidad urbana en la metrópolis de Barcelona, con el objetivo de responder a las preguntas de investigación y poner a prueba hipótesis planteadas. Al tratarse de una tesis que se presenta en el formato de compendio de artículos, cada estudio de caso tiene su propia sección metodológica (consultar la *Parte IV Resultados*). No obstante, se cree conveniente ofrecer en este capítulo una explicación del marco metodológico de la tesis a modo general.

El presente capítulo se estructura en tres subapartados que abordan los aspectos fundamentales de la metodología usada en la tesis. En primer lugar, el subapartado 6.1. explica el diseño metodológico adoptado, basado en una estrategia multimetodológica y multiescalar. El subapartado 6.2. ahonda en el ámbito de estudio seleccionado, centrado en la metrópolis de Barcelona y también, más específicamente, en el distrito de Nou Barris. Se presentan los fundamentos que respaldan esta elección, explicando las razones que convierten a estas áreas geográficas en casos de estudio relevantes y apropiados para el estudio de la vitalidad urbana. Finalmente, en el subapartado 6.3., se describen en detalle las técnicas y fuentes de datos utilizadas en el análisis.

6.1. Explorando la complejidad: Un enfoque multimetodológico y multiescalar en la investigación

El plan de investigación de esta tesis utiliza un diseño multimetodológico y multiescalar. Por diseño multimetodológico (mixed-methods, en inglés) se refiere a un esquema de trabajo que supera la dicotomía clásica de los enfoques cuantitativo y cualitativo y en su lugar, combina estos dos métodos para aprovechar las potencialidades de cada uno (Hesse-Biber & Johnson, 2016). Los métodos cuantitativos suelen ser eficaces para obtener datos de una gran muestra y proporcionar resultados generalizables. En cambio, los métodos cualitativos son útiles para entender las experiencias y los significados atribuidos a los fenómenos. En las ciencias sociales, son varias las razones por las cuales ha habido un creciente interés en la combinación de metodologías en las últimas décadas. Por ejemplo, porque aporta flexibilidad al análisis, permitiendo adaptar el método en las diferentes etapas del proceso de investigación y a los diferentes sujetos de estudio; porque permite la triangulación, es decir, verificar los hallazgos a través de diferentes métodos; o bien porque el fenómeno de estudio necesita comprenderse desde diferentes perspectivas.

En el caso de esta tesis doctoral, la motivación principal para utilizar este enfoque multimedológico responde a que se parte de la visión teórica planteada por Jane Jacobs de entender la ciudad como un problema de complejidad organizada, como un lugar lleno de

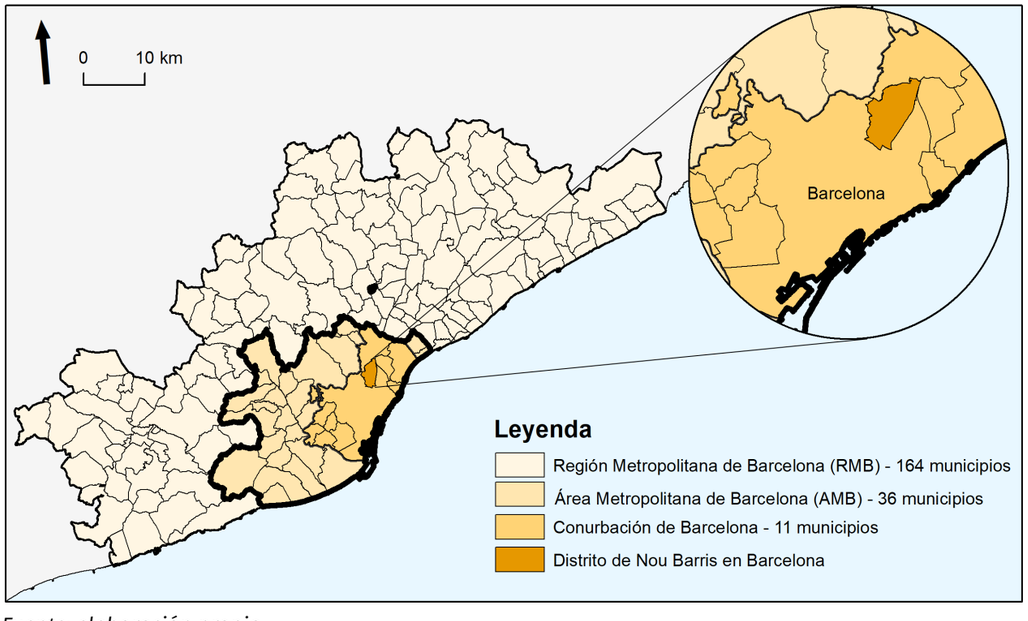
múltiples conexiones cotidianas que interactúan entre sí que deben ser examinadas adoptando diferentes perspectivas y escalas de análisis (Jacobs, 1961, p. 477). Así, la tesis ha desarrollado cinco estudios de caso que combinan diferentes técnicas de investigación y fuentes de datos con la idea de obtener una comprensión más completa y rica sobre la vitalidad urbana, que se explicarán con más detalle en el subapartado 7.3.

A su vez, la adopción de esta visión teórica jacobsiana ha comportado que el diseño de la investigación tenga un enfoque multiescalar, permitiendo capturar la complejidad de la vida urbana al considerar las interacciones a diferentes escalas. El análisis de las condiciones de la vitalidad urbana y su relación con la cotidianidad requiere una aproximación que abarque desde el nivel micro de la calle hasta escalas superiores como el barrio, el distrito, la ciudad y finalmente, la escala metropolitana. Para incorporar este enfoque multiescalar, el diseño de la investigación ha involucrado la selección de diversos ámbitos de estudio, la utilización de fuentes de datos con distintas resoluciones y la aplicación de técnicas de análisis específicas. Estos aspectos serán abordados en mayor profundidad en los próximos subapartados.

6.2. Área de estudio

Esta tesis se centra en analizar la vitalidad urbana en la metrópolis de Barcelona (Figura 6). La elección de esta área de estudio se basa en la falta de investigaciones aplicadas en este contexto en la literatura existente. Como se mencionó en el anterior capítulo, existe una escasa evidencia proveniente de contextos urbanos con un desarrollo histórico y morfologías urbanas similares a los de las ciudades mediterráneas. Además, muchos estudios relacionan la vitalidad urbana únicamente con tramas urbanas compactas y centrales, y con barrios con población socialmente privilegiada, mientras que otros espacios situados en espacios más

Figura 6. Área de estudio.



Fuente: elaboración propia.

periféricos y con otras características morfológicas o bien se identifican con niveles bajos de vitalidad, o bien están por explorar. De este modo, esta tesis pretende abordar estas cuestiones centrándose en el contexto urbano de una ciudad mediterránea, la metrópolis de Barcelona y poniendo el foco en el distrito de Nou Barris. A continuación, se proporciona una descripción detallada de estos contextos urbanos, centrándose en su historia y desarrollo urbano para brindar un contexto histórico de estos lugares, y resaltando la importancia de estudiar la vitalidad urbana en estos entornos.

6.2.1. La metrópolis de Barcelona

El área de estudio utilizada en esta tesis que abarca una extensión mayor de territorio es la Región Metropolitana de Barcelona (RMB). La RMB comprende 164 municipios y, aunque no cuenta con un marco legal y de gobernanza establecido, se considera como el marco territorial de referencia para el planeamiento urbano en la metrópolis de Barcelona (Generalitat de Catalunya, 2010). A pesar de su fragmentación institucional, la RMB desempeña un papel crucial como área urbana funcional y constituye un punto de referencia importante en los estudios de la realidad metropolitana de Barcelona, especialmente aquellos que analizan la movilidad cotidiana (Delclòs-Alió & Miralles-Guasch, 2018a; Maciejewska et al., 2019; Marquet et al., 2017; Marquet & Miralles-Guasch, 2018).

La población de la RMB se estima en alrededor de 5,2 millones de habitantes, distribuidos en un área de aproximadamente 3,000 km^2 que se extiende en un radio de unos 40-45 kilómetros (IDESCAT, 2023). Esta área metropolitana es una de las más importantes del sur de Europa, albergando aproximadamente el 10% de la población española y el 64% de la población de la comunidad autónoma de Cataluña. La RMB no es un territorio homogéneo en cuanto a su composición urbana, ya que ha sido moldeado por diferentes procesos históricos, similar al de muchas metrópolis maduras europeas, que han dado lugar a diferentes formas urbanas (Subirats & Tomàs, 2006). El resultado es una región metropolitana policéntrica articulada en torno a diferentes anillos que presentan una diversidad de realidades urbanas (Miralles-Guasch & Tulla Pujol, 2012).

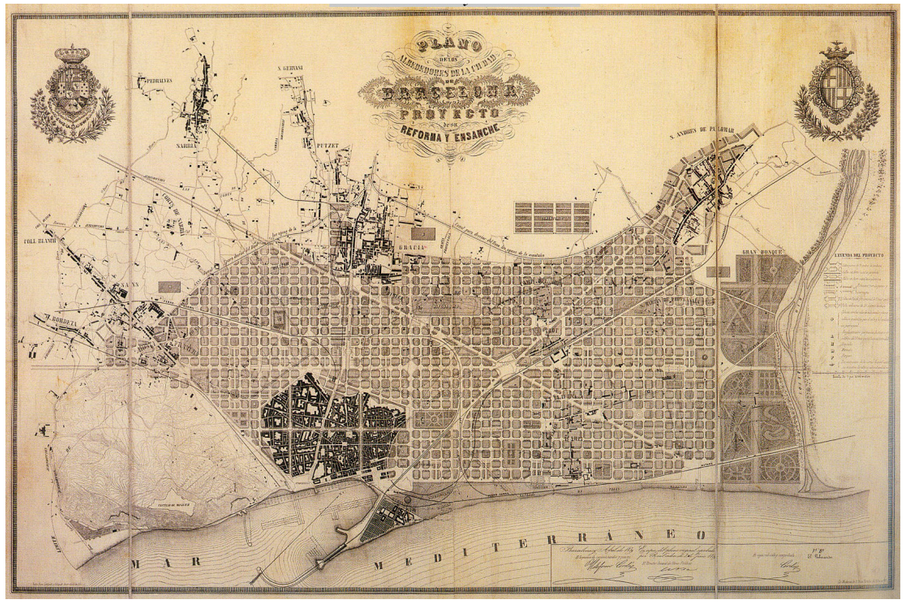
El núcleo de la RMB es la ciudad de Barcelona, que actualmente alberga a una población total de 1,636,193 habitantes en un territorio de 101.35 km^2 (IDESCAT, 2023). En general, la ciudad exhibe una alta densidad poblacional, con una densidad promedio de 16,144 h/km^2. Sin embargo, estas cifras varían en los 10 distritos y 73 barrios de la ciudad debido a su desarrollo histórico desigual, con densidades que oscilan entre cifras muy altas de 58,583 hab./km^2 en el barrio de *Sants-Badal* y muy bajas de 414 hab./km^2 en el barrio de Vallvidrera, el Tibidabo i les Planes (Ajuntament de Barcelona, 2020).

El desarrollo urbano de Barcelona se acelera a partir del siglo XIX, cuando la ciudad deja atrás la urbe medieval amurallada para dar paso a una ciudad industrial. Durante este período, la ciudad se expandió anexando municipios vecinos como Les Corts, Sant Martí, Gràcia, Sants, Sant Andreu y Sant Gervasi, que se integraron administrativamente convirtiéndose en barrios de Barcelona (López, 2010). La construcción del Ensanche fue un factor clave en esta integración (Figura 7), que se completó en 1921 con la anexión de *Sarrià* y la estabilización de los límites municipales.

Como explica Nel·lo (2002), las dinámicas urbanas de la metrópolis de Barcelona, al igual que en otras áreas urbanas de España, se caracterizaron por una transformación que siguió primero una fase de concentración (1959-1975) y más delante de dispersión (1975-1996).

Primero, la población de Barcelona siguió creciendo y la ciudad recibió olas migratorias desde otras regiones de España hacia Cataluña durante las décadas de los sesenta y setenta. Una gran parte de esta población se concentró en barrios periféricos a través de la construcción de proyectos de vivienda de alta densidad, y en viviendas de autoconstrucción. Esto resultó en la urbanización y densificación de las áreas situadas en los márgenes de Barcelona, dando origen a nuevos barrios, principalmente en los distritos de Horta-Guinardó y Nou Barris.

Figura 7. Plan Cerdà presentado en 1859.



Fuente: Arxiu Històric de la ciutat de Barcelona.

El aumento de la población también condujo a la formación de lo que ahora conocemos como la *conurbación de Barcelona*, que ese extendió por los municipios cercanos a los ríos a ambos lados de Barcelona; el río Llobregat (L'Hospitalet de Llobregat, Cornellà de Llobregat, Esplugues de Llobregat...) y el río Besòs (Santa Coloma de Gramenet, Sant Adrià del Besòs, Badalona...). Estas ciudades surgieron como áreas residenciales de alta densidad que albergaban a la clase trabajadora y se consideraban "ciudades dormitorio" (Subirats & Tomàs, 2006). Aunque la conurbación no tiene una entidad administrativa en sí misma, se refiere al "fenómeno geográfico que ocurre cuando varios núcleos urbanos inicialmente independientes y contiguos en sus márgenes crecen y se convierten en una unidad funcional" (RAE, 2023).

A finales del siglo XX, en las décadas de los ochenta y noventa, se observaron nuevas dinámicas urbanas propias de la globalización en la Barcelona metropolitana. Estas estuvieron caracterizadas por el declive de la industria, la dispersión de la población y actividades hacia las áreas periféricas, las cuales experimentaron un aumento de población y un mayor protagonismo en las dinámicas económicas, impulsadas por la terciarización. Además, otros aspectos de la globalización a finales de los noventa incluyeron la llegada de una nueva inmigración, en este caso extracomunitaria, lo que frenó la disminución de población en el núcleo urbano central. En consecuencia, las clases medias de dicho núcleo se trasladaron a la periferia en busca de viviendas más competitivas en términos de precio y mayor calidad y confort. En este contexto, se consolidan lo que se conoce como el primer y segundo anillo de la Región Metropolitana de Barcelona.

El primer anillo está formado por los 36 municipios que forman el Área Metropolitana de Barcelona (AMB), que se consolida legalmente en el 2010 como una institución de gobernanza metropolitana (Tomàs Fornés, 2017). En una extensión de 636 km2 concentra una población de alrededor de 3.2 millones de habitantes, de manera que representa un 42,8 % de la población total de Cataluña. La AMB forma un continuo urbano con la ciudad central y está conformado por municipios caracterizados por una densidad y desarrollo urbano desigual, donde encontramos la alta densidad de la conurbación, densidades medias y dispersión urbana.

El segundo anillo metropolitano presenta una mayor heterogeneidad en términos de urbanización y desarrollo interno (Miralles-Guasch & Tulla Pujol, 2012). En este territorio se ubican de manera descentralizada siete ciudades históricas de tamaño medio que comparten una morfología compacta similar a la del municipio central de Barcelona, con altas densidades y una combinación de usos del suelo (Nel·lo, 2002). Al mismo tiempo, este segundo anillo metropolitano está compuesto por municipios más pequeños con desarrollos dispersos y densidades inferiores a 1000 habitantes por kilómetro cuadrado (Garcia-López, 2010).

En definitiva, la escala de la metrópolis de Barcelona se presenta como un área de estudio de gran interés para comprender la vitalidad, dada su diversidad de realidades urbanas que surgen de diferentes desarrollos históricos y su conexión entre sí en un sistema urbano policéntrico. Dentro de esta escala metropolitana, esta tesis doctoral ha utilizado dos subniveles de análisis.

A una escala más amplia, se ha elegido la Región Metropolitana de Barcelona (RMB) como área de estudio en uno de los casos de análisis de esta tesis, concretamente el estudio de caso 4, enfocado en el análisis de la movilidad. Esta elección se fundamenta en la necesidad de comprender las dinámicas de movilidad a través de una perspectiva metropolitana que permita abordar los flujos de manera amplia y compleja.

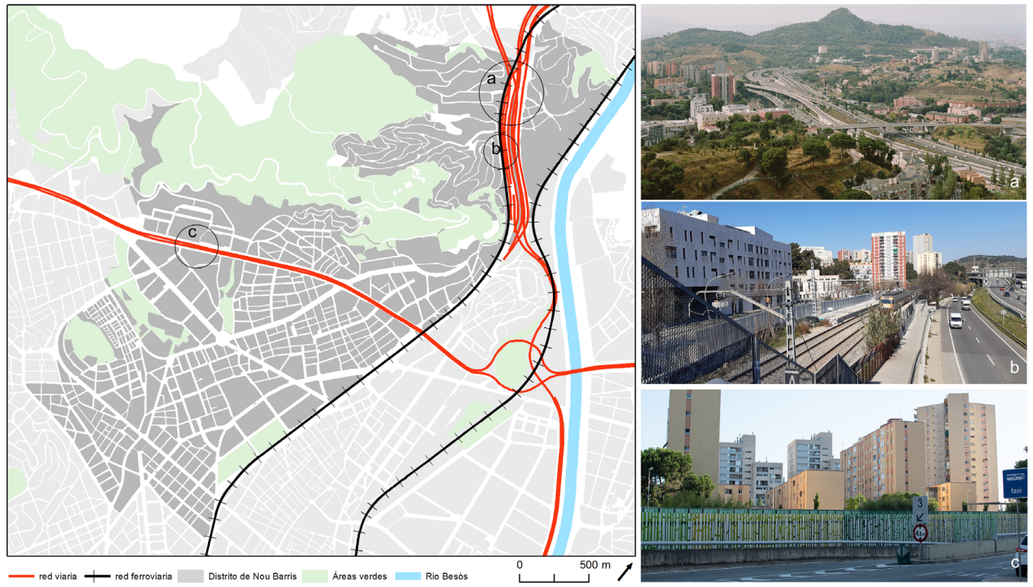
En un subnivel adicional, se ha utilizado la conurbación de Barcelona como área de estudio. Esta área es de relevancia para el análisis de la vitalidad urbana, habiéndose utilizado previamente por Delclòs et al. (2018b), dado que representa la extensión geográfica de la ciudad central. Con todo, resulta un nivel de análisis desde el cual se pueden estudiar fenómenos y dinámicas sociales como las desigualdades urbanas, los usos del espacio urbano y el turismo. En este sentido, la conurbación de Barcelona ha sido seleccionada como área de estudio en dos casos de investigación incluidos en esta tesis doctoral: el estudio de caso 2, que examina la relación entre la vitalidad urbana y la vulnerabilidad social, y el estudio de caso 3, centrado en el análisis de la diversidad comercial en relación con la vulnerabilidad social y el turismo.

6.2.2. El distrito de Nou Barris

A parte de abordar la vitalidad urbana desde un contexto metropolitano, esta tesis pone el foco en el contexto específico del distrito de Nou Barris en Barcelona. Situado en el extremo norte de la ciudad, limita administrativamente al oeste con el distrito de Horta-Guinardó y al este con el distrito de Sant Andreu por la Avenida Meridiana. Con un total de 167.868 habitantes, el distrito abarca 13 barrios y representa el 10,36% de la población de la ciudad (Ajuntament de Barcelona, 2020). La densidad de población promedio es de 209 hab./ha, superior a la de Barcelona (159 hab./ha), y se distribuye de manera desigual en sus diversos barrios. Nou Barris se distingue de otros distritos de la ciudad por su morfología urbana, influenciada por dos aspectos clave: su ubicación geográfica y la configuración de los barrios en función de un desarrollo urbanístico con diferentes grados de planificación.

Nou Barris es uno de los distritos que limita con la sierra de Collserola. Su ubicación geográfica lo convierte en un punto de conexión ambiental entre la ciudad y la montaña en el contexto metropolitano, así como con el río Besòs y la red de riego del Rec Comtal desde el barrio de *Vallbona*. Al mismo tiempo, esta localización implica que el distrito presenta una orografía marcada por pendientes, lo que supone desniveles en las calles de sus barrios. Además, se encuentra cerca de diversas infraestructuras viales de alta capacidad que son la entrada a la ciudad de Barcelona, como la Autopista del Vallès, la *Ronda de Dalt* y las vías de ferrocarril y trenes de cercanías (Figura 8). Por lo tanto, la orografía montañosa y la presencia de estas grandes infraestructuras han sido elementos clave en la configuración del entorno construido de Nou Barris, dificultando la conectividad tanto entre los barrios del distrito como entre los barrios vecinos de la ciudad. Esta situación se agrava en los barrios conocidos como la Zona Norte (*Vallbona*, *Ciutat Meridiana* y *Torre Baró*), donde el trazado urbano se caracteriza por una alta sinuosidad con calles estrechas y pendientes pronunciadas, y donde las interferencias con las infraestructuras y los fuertes desniveles interrumpen la continuidad urbana.

Figura 8. El Distrito de Nou Barris en relación a las infraestructuras de transporte.



Fuente: elaboración propia. Fotografías: a) Myriam Meloni y Arnau Bach. B) Wefer.com, c) fotografía propia.

La morfología urbana del distrito también es el resultado de diversos eventos históricos, lo que ha influido en su composición sociodemográfica particular en comparación con el resto de la ciudad y el contexto metropolitano. Hasta finales del siglo XIX, Nou Barris era principalmente una zona rural con un pequeño núcleo urbano de origen medieval que se desarrolló alrededor de la Iglesia de Santa Eulàlia de Vilapicina, que actualmente corresponde al barrio de *Vilapiscina i la Torre LLobeta*. Con la industrialización, el paisaje rural comenzó a albergar pequeñas industrias y grandes infraestructuras que se trasladaron a la periferia de la ciudad que aún se encuentran en la actualidad, como el Depósito de Aguas. La llegada progresiva de población obrera a principios del siglo XX dio lugar inicialmente a un proceso de urbanización disperso que resultó en asentamientos informales de chabolas primero, y en más tarde en promociones de viviendas como las casas baratas, ubicadas en *Can Peguera* (García Soler, 1998). Las casas baratas eran un conjunto de viviendas públicas de bajo coste y de una sola planta que acogió a la población desahuciada del barrio de Montjuïc para la

celebración de la Exposición Internacional del 1929.

Sin embargo, la llegada masiva de nueva población al distrito se produjo entre las décadas de los cincuenta y setenta. Fue entonces cuando se produjo una gran transformación por la creciente llegada de mano de obra migrante de las zonas rurales de España después de la Guerra Civil española. Los recién llegados se establecieron en asentamientos de chabolas autoconstruidas, algunas de ellas aún permanecen en el barrio de *Torre Baró*, y también, en proyectos públicos de grandes bloques de viviendas en los barrios de *Verdum*, *Roquetes*, *Ciutat Meridiana*, *la Guineueta*, *Porta*, *El Turó de la Peira* y *Canyelles*. Estos barrios de nueva construcción presentaban graves deficiencias urbanas y casi ninguna conexión con el resto de la ciudad. Estas carencias y la gran concentración de población de clase trabajadora fomentaron la creación de una amplia y activa red de asociaciones que exigían mejores condiciones materiales y urbanas para sus viviendas y barrios (Domingo i Clota & Bonet i Casas, 1998). Sus demandas obligaron a los poderes públicos a mejoras en la urbanización que se llevaron a cabo principalmente durante los primeros años de la democracia española, bajo el gobierno de Pasqual Maragall, que realizó varias intervenciones en viviendas, espacios públicos y provisión de infraestructuras, contribuyendo a dignificar este distrito tradicionalmente marginado (García Soler, 1998).

El fuerte sentido de pertenencia colectiva de los barrios, la participación ciudadana y las redes sociales de apoyo existentes han contribuido a la cohesión social de Nou Barris, siendo el distrito con el mayor número de equipamientos con gestión ciudadana de la ciudad (Ajuntament de Barcelona & Ciutat Invisible, 2016). Sin embargo, Nou Barris, con once de los dieciséis barrios más pobres de la ciudad (Oficina Municipal de Dades de l'Ajuntament de Barcelona, 2017), aún enfrenta condiciones socioeconómicas desfavorables, agravadas por la sucesión de crisis de las últimas décadas, desde la crisis de 2008, la pandemia de la Covid-19 y hasta la actualidad. Esto se ha reflejado en que el distrito cuenta con varios indicadores de riesgo de vulnerabilidad (Tabla 1), como uno de los índices más bajos de ingreso real disponible de los hogares y nivel educativo de Barcelona, una tendencia vigorosa de envejecimiento de la población y el debilitamiento de la acción comunitaria.

Tabla 1. Datos sociodemográficos y económicos del distrito de Nou Barris, Barcelona.

	Año	*Nou Barris*	*Barcelona*
Población [a]	2021	173.944	1.660.314
Densidad de población (hab./km2)[a]	2021	21.743	16.245
%Población extranjera/ total de la población[b]	2021	19,88%	21,97%
Índice de envejecimiento[b]	2021	158,8	161
%Población sin estudios o estudios primarios[b]	2020	29,01%	17,91%
%Población con estudios universitarios[b]	2020	15,48%	33,42%
Índice de Renta familiar disponible por capita[b]	2018	15.924	21.484
Paro registrado (junio)[c]	2023	7,9%	5,7%

Fuentes:
a Padrón municipal de habitantes. Institut d'Estadística de Catalunya (IDESCAT), 2021.
b Anuario Estadístico de la ciudad de Barcelona, 2021.
c Departamento de Estadística del Ayuntamiento de Barcelona, 2023.

Así pues, Nou Barris presenta un conjunto de ingredientes que hacen que el estudio de la vitalidad urbana poniendo el foco en este contexto resulte un ejercicio interesante. En especial, por la orografía desigual, la diversidad morfológica y la caracterización socioeconómica del distrito. Por ello, Nou Barris ha sido seleccionado como área de análisis en los estudios de caso 1 y 5.

6.3. Técnicas de análisis y fuentes de datos utilizadas

Esta tesis doctoral tiene la voluntad de entender la vitalidad urbana teniendo en cuenta su dimensión espacial. Bajo esta visión geográfica, se han utilizado tanto fuentes de datos y técnicas de análisis cuantitativas como cualitativas.

6.3.1. Enfoque cuantitativo

El enfoque cuantitativo, ampliamente utilizado en la literatura sobre la temática, se basa en cuantificar las condiciones descritas por Jacobs como impulsores de la vitalidad urbana y comprender su relación con variables de interés vinculadas a las dinámicas cotidianas y fenómenos sociales. En esta tesis doctoral, bajo este enfoque cuantitativo, se emplean dos tipos de fuentes de datos que son analizadas mediante técnicas de investigación distintas. Por un lado, se utilizan datos georreferenciados procesados mediante Sistemas de Información Geográfica (SIG) para realizar análisis espaciales, y, por otro lado, se utiliza una encuesta tradicional de movilidad y se lleva a cabo un análisis estadístico.

Los datos georreferenciados son un tipo de datos que contienen información espacial, ya que están asociados con coordenadas geográficas que indican la ubicación de elementos en el espacio. Estos datos se almacenan en forma de capas, y pueden representarse como puntos, líneas o polígonos, dependiendo del fenómeno y los elementos que se estén analizando. En esta tesis doctoral, por ejemplo, se utilizan datos en formato de puntos para representar la ubicación de comercios en la ciudad, datos lineales para representar la red vial, y datos poligonales para representar divisiones de uso del suelo o los límites administrativos. Estos datos georreferenciados también incluyen atributos, que son información asociada a los elementos representados. Los atributos pueden ser numéricos, como el área, la densidad o la renta, o cualitativos, como el tipo de uso del suelo o el tipo de actividad de un establecimiento. No obstante, para realizar análisis espaciales, en esta tesis la información cualitativa se ha agregado de manera cuantitativa.

En relación a los tipos de análisis espaciales aplicados a estos datos georreferenciados, se han empleado el análisis descriptivo, el Análisis Exploratorio de Datos Espaciales (ESDA, por sus siglas en inglés) y el análisis de clústeres. En un primer nivel descriptivo, se han utilizado las herramientas SIG para visualizar cartográficamente la información relativa a los fenómenos estudiados. Esto ha permitido comprender la distribución espacial de las condiciones para la vitalidad urbana y otras variables estudiadas. Esta aproximación ha posibilitado detectar patrones espaciales de manera exploratoria, que posteriormente han sido verificados mediante técnicas de análisis espacial que tienen en cuenta la dependencia estadística y espacial. En el estudio de caso 1, por ejemplo, se ha operativizado la vitalidad urbana en variables concretas a partir de datos georreferenciados del entorno construido, cartografiándolas para comprender su distribución espacial en el distrito de Nou Barris. Además, el análisis descriptivo también se usado en los estudios de caso 2 y 3 como un paso inicial para comprender la distribución

espacial de diferentes fenómenos en la conurbación de Barcelona. En el estudio de caso 2, se ha explorado la distribución espacial de la vitalidad urbana y la vulnerabilidad social, y en el estudio de caso 3, se ha examinado la distribución espacial de los usos, actividades y alojamientos turísticos.

Posteriormente, se han aplicado técnicas de Análisis Exploratorio de Datos Espaciales (ESDA), que tienen como objetivo identificar la autocorrelación espacial, es decir, la dependencia espacial entre las observaciones considerando su ubicación geográfica. El ESDA se basa en la Primera Ley de la Geografía, que establece que las cosas cercanas están más relacionadas entre sí (Tobler, 1970). Las técnicas del ESDA permiten analizar y comprender las relaciones de dependencia espacial mediante el cálculo de diversos indicadores de autocorrelación espacial, como el índice de Moran, para revelar patrones espaciales, como agrupamientos o dispersión, entre una o dos variables. En el estudio de caso 2, por ejemplo, se han empleado estos indicadores para comprender la relación espacial entre la vitalidad urbana y la vulnerabilidad social, identificando diferentes escenarios en función de cómo se manifiesta dicha relación.

También se ha aplicado el análisis de clúster, una técnica empleada en la tesis para identificar conglomerados de elementos que se encuentran geográficamente cercanos y comparten características comunes, diferenciándose de otros grupos (de Smith et al., 2007). En el estudio de caso 3, que pretende estudiar la relación espacial entre la diversidad de actividades, la vulnerabilidad social y la presión turística, se ha utilizado un análisis de Clúster Multivariado a través de la herramienta Multivariate Clustering del software ArcGISPro®, que permite crear grupos considerando estas múltiples variables simultáneamente mediante el algoritmo k-means.

En este análisis espacial basado en datos georreferenciados, se utilizaron dos tipos de unidades espaciales de análisis: las secciones censales y la malla de cuadrículas. La estrategia para utilizar estas unidades espaciales buscaba adaptarse a la resolución original de los datos disponibles y priorizar el mayor nivel de desagregación posible. En el caso de las secciones censales, empleadas en el estudio de caso 4, se corresponden con divisiones administrativas que siguen criterios oficiales y están determinadas por la distribución de la población urbana. Por otro lado, se creó una malla que divide el área de estudio en celdas rectangulares de tamaño uniforme utilizando la herramienta Fishnet del software ArcMap®, un recurso previamente utilizado en estudios que emplean análisis espacial (Y. Xu et al., 2017), ya que, entre sus potencialidades, permite combinar datos de diferentes resoluciones en una estructura homogénea. En el estudio de caso 1 se utilizó una malla de 50x50 metros, mientras que en el estudio de caso 2 se empleó una malla de 100x100 metros. Ambas permiten utilizar una resolución que se corresponde con el nivel de calle.

El otro tipo de datos cuantitativos que se han utilizado provienen de una encuesta oficial tradicional sobre movilidad cotidiana, específicamente la Encuesta de Movilidad en Días Laborables (EMEF, por sus siglas originales en catalán), en la edición del año 2015. El propósito principal consiste en comprender una dimensión de la vida cotidiana, en particular, la movilidad relacionada con el cuidado, y analizar su vínculo con las características de la población y del territorio, desde una perspectiva de género. Estas encuestas proporcionan información valiosa sobre patrones de comportamiento en los desplazamientos diarios, hábitos de movilidad, tiempos y distancias de desplazamiento, modos de transporte utilizados, así como datos sociodemográficos del perfil de los individuos desplazados. Para su análisis, se han empleado técnicas estadísticas, comenzando por un nivel descriptivo y posteriormente complementado con análisis de regresión estadística, que permite comprender las relaciones

entre dos variables mediante un modelo matemático.

6.3.2. Enfoque cualitativo

Respecto al enfoque cualitativo, a pesar de que los planteamientos de Jacobs se expresan de manera cualitativa, ha recibido menos atención en la literatura que explora las ideas de vitalidad urbana de Jacobs. Jacobs basa su análisis en la descripción y observación cotidiana de la vida en la calle y en su propio barrio. En esta tesis, se emplea un enfoque cualitativo actualizado que incorpora nuevas metodologías participativas, utilizando la técnica *fotovoz*. Esta técnica usa la fotografía como una herramienta para comprender la relación entre la vida cotidiana y los entornos urbanos. De hecho, Whyte ya utilizó la fotografía en los años 70 para realizar observaciones en el espacio público (Whyte, 1980). Sin embargo, la técnica fotovoz va más allá de la observación de la persona investigadora, ya que involucra a los participantes mediante imágenes (fotografía) y discusiones grupales (voz) para documentar y reflexionar sobre sus propias realidades.

Además, la técnica fotovoz se alinea con uno de los objetivos centrales de esta tesis, que consiste en comprender la comprensión de la vitalidad urbana desde diversas perspectivas y sujetos de análisis. El fotovoz ha ganado reconocimiento en los últimos años en investigaciones que trabajan con mujeres y otras voces marginadas a menudo son excluidas en la producción de conocimiento (Balvanz et al., 2016; Budig et al., 2018; Dassah et al., 2017; Davis et al., 2020; Derr & Simons, 2020; Hemy & Meshulam, 2021; Kornbluh et al., 2015). Basado en los principios desarrollados por el pedagogo Paulo Freire, el fotovoz reconoce que las personas son expertas en sus propias vidas y que el conocimiento se construye a través del diálogo crítico entre ellas. De esta manera, la técnica del fotovoz busca romper con las relaciones de poder inherentes a otros métodos de investigación cualitativa, como las entrevistas, donde el investigador "extrae" el conocimiento. En cambio, el fotovoz reconoce a los participantes como creadores de conocimiento y utiliza un lenguaje más universal. Invita a los participantes a capturar fotografías de su entorno, compartirlas con otros, explicar los significados y las historias que se encuentran detrás de las imágenes, así como a expresar sus visiones y dialogar colectivamente al respecto, identificando las necesidades de la comunidad (Coemans et al., 2019). En concreto, en esta tesis se ha seleccionado a los jóvenes como grupo de estudio, un colectivo de población que tradicionalmente ha quedado excluido de la discusión urbana, y cuyo estudio se centra en el caso de estudio 5.

En la Tabla 2 se presenta un resumen de los estudios de caso realizados en relación con las preguntas de investigación específicas y objetivos planteados en esta tesis, la metodología, el ámbito de estudio, la escala y las fuentes de datos empleadas en cada uno de ellos.

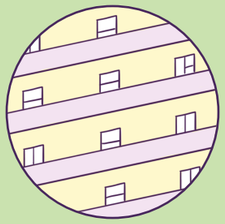
Tabla 2. Resumen de los estudios de caso de la tesis, sus objetivos, su relación con las preguntas de investigación planteadas y la metodología usada.

Estudios de caso	Objetivo del estudio	Preguntas inv. específicas					Ámbito de estudio	Escala territorial	Enfoque	Fuentes de datos	Análisis
		1.1.	1.2.	1.3.	2.1.	2.2.					
EC1: Jane Jacobs reloaded: A contemporary operationalization of urban vitality in a district in Barcelona	Operativización cuantitativa y espacial de la vitalidad urbana.	■	■	■			Nou Barris	distrito, barrio y calle	cuant.	datos georreferenciados entorno construido, capas SIG	Creación índice sintético. Análisis descriptivo
EC2: Are vital neighbourhoods socially privileged? Exploring the spatial relationship between urban vitality and urban vulnerability	Estudiar la relación entre vitalidad y vulnerabilidad urbana.				■		Conurbación	sección censal	cuant.	datos georrefenciados entorno construido (índice JANE) + datos georreferenciados vulnerabilidad social (índice IVU)	Análisis Exploratorio de Datos Espaciales (ESDA)
EC3: Spatial distribution of retail diversity in relation to social vulnerability and touristic intensity. The case of Barcelona	Entender la relación espacial entre la diversidad de usos, la vulnerabilidad urbana y la presión turística.			■	■		Conurbación	sección censal	cuant.	datos georreferenciados entorno construido + actividad turística	Regresión, análisis de clúster y descriptivo.
EC4: Accounting for care in everyday mobility: an exploration of care-related trips and their sociospatial correlates	Analizar la relación entre la movilidad del cuidado y las características socioespaciales.					■	RMB	municipal	cuant.	encuesta de movilidad	Análisis descriptivo.
EC5: Youth perceptions on urban vitality. A photovoice study on the Everyday Experiences of Public Space	Comprender los elementos que contribuyen a la vitalidad urbana desde una perspectiva cualitativa.	■		■	■	■	Nou Barris	barrio y calle	cual.	fotografías, grupos de discusión	Fotovoz. Análisis del discurso y de fotografías.

Fuente: elaboración propia. Preguntas de investigación específicas: P1.1. ¿En qué medida las teorías de la vitalidad urbana propuestas por Jane Jacobs en 1961 son aplicables a las dinámicas de las ciudades mediterráneas actuales y cómo han sido ampliadas y actualizadas en el contexto contemporáneo?; P1.2. ¿Cómo se pueden analizar las condiciones teóricas de la vitalidad urbana de manera aplicada teniendo en cuenta diversos contextos urbanos y sujetos de análisis?; P1.3. ¿Cómo se trasladan espacialmente las condiciones de la vitalidad urbana en los contextos urbanos de las ciudades mediterráneas actuales?; P2.1. ¿Cuál es la relación entre las condiciones de vitalidad urbana y procesos contemporáneos de la ciudad global mediterránea, como el aumento de las desigualdades sociales intraurbanas y la presión turística?; P2.2. ¿En qué medida las condiciones de vitalidad urbana influyen en la promoción de la sostenibilidad de la vida y la provisión de cuidados en los entornos urbanos?

PARTE IV:

RESULTADOS



Capítulo 7

Operativización cuantitativa y espacial de la vitalidad urbana

7.1. Jane Jacobs reloaded: A contemporary operationalization of urban vitality in a district in Barcelona

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Jane Jacobs reloaded: A contemporary operationalization of urban vitality in a district in Barcelona

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ABSTRACT

The theories of Jane Jacobs have gained momentum as a framework to address the challenges faced by present-day cities. Of special relevance is the concept of urban vitality as an indicator of street vibrancy and quality of life among city residents. This study aims to revisit her principles from an applied perspective by developing an updated index that measures the conditions for urban vitality as described in her most celebrated book, *The Death and Life of Great American Cities* (1961), and by also incorporating contemporary contributions made by recent literature on the topic. We develop a composite measure of 22 variables of the built and social environment, and we test it in the urban context of a peripherical and low-income district in Barcelona (Spain). Results show that urban vitality can be found in a wide variety of urban spaces such as compact fabrics and even housing projects, only when population density is combined with physical features that promote intense and diverse human activity. The methodological tool developed in this paper is intended to serve as a basis for future research as well as to guide public policies that aim to address some of the key challenges of contemporary urban agenda.

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7.1.1. Introduction

Cities can be regarded as successful when they are capable of hosting vibrant street activity, whereby people with different characteristics can safely come together in the public space, at different times, and for different purposes. Vitality is, ultimately, an indicator of *good* urbanism (Lynch, 1984), as vital environments offer everything that citizens need, not only to transit public spaces, but to *stay* and *use* them. One of the first voices advocating such ideas of diversity, vitality, and street buoyancy was the American-Canadian theorist Jane Jacobs (1916-2006). By opposing most of the principles and logics accepted as common-practice during her life, Jacobs provided a new approach to understanding how cities work, which she accomplished by shifting the focus from what was built (or to be built) to human beings (Sassen, 2016; White, 2014).

Her principles have been recurrently rediscovered and revisited to respond to different needs and from different contexts, and are still relevant in the present day (Hirt & Zahm, 2012). Many citizen organizations have incorporated her arguments to evaluate the neighborhood built environment using community-based approaches, for example, through different city walks inspired by Jane Jacobs (Jane's walk, 2020). Cities and other public institutions worldwide are also including her principles, either explicitly or implicitly, as part of their local planning strategies (Klemek, 2007; Schubert, 2014). Recent initiatives such as the "15-minute city" are a clear example of urban interventions that rely on the ideas about compact, diverse, and accessible cities (an ideology once coined by Jane Jacobs), some of which are likely to prevail in the post-COVID-19 era (Moreno et al., 2021). Accordingly, her theories have also received increasing attention from urban researchers around the world, who have used her principles as a framework, and her general view on urban vitality as a lens through which we can reflect on how cities succeed or fail in guaranteeing quality of life for people (M. N. Lopes & Camanho, 2013).

More specifically, there is a growing line of research that aims to quantify the Jacobs postulates by using objective measures of the built and social environment (Braun & Malizia, 2015; De Nadai et al., 2016; Delclòs-Alió & Miralles-Guasch, 2018b; Q. He et al., 2018; Jin et al., 2017; Lu et al., 2019; H. Sung et al., 2015; C. Wu et al., 2018; Zeng et al., 2018). Most of these efforts rely on high-resolution techniques to apply the ideas that Jacobs developed in New York in the 1960s to present-day cities. However, to properly analyze the potential vitality of today's cities, the Jacobs principles need to be updated by considering new insights and indicators of what can constitute vibrant city life. Furthermore, most of these analyses explore the ideas of Jacobs in large urban areas or in central and well-off neighborhoods, while there is less evidence of how the conditions of vitality play out in peripheral and more vulnerable areas. With this in mind, and based on related literature and previous work, the aim of this paper is to present a methodological tool that captures the potential of urban spaces to be vital environments. We provide an updated and extended version of the JANE Index of urban vitality (Delclòs-Alió & Miralles-Guasch, 2018b), now composed of 22 variables of the built and social environment, which we then use to characterize the potential of urban vitality of Nou Barris, a peripheral low-income district in Barcelona (Spain).

7.1.2. Background

7.1.2.1. The conditions for urban vitality according to Jane Jacobs

In her definitive statement on American cities, *The Death and life of Great American Cities* (1961), Jacobs described four generators of urban vitality: the need for primary mixed uses, the need for small blocks, the need for aged buildings and the need for concentration. First, Jacobs considered urban spaces that gathered multiple uses would be capable of hosting different activities throughout the day, which in turn would attract people with different needs and with different purposes. Second, Jacobs considered that cities should be designed at the human scale in order to provide opportunities for human contact, and thus they would be more conducive for social interaction. Third, Jacobs suggested that diverse and vibrant neighborhoods would require a certain degree of social mixture. In order to welcome different types of population, she considered it essential for cities to preserve a certain balance between new and old buildings, which from her perspective and in her time was an indicator of housing affordability. Fourth, Jacobs defended that concentration (of activities and people) could be regarded as the key requirement for urban vitality. She specifically referred to density of buildings, residences and population. Throughout her book Jacobs also mentioned two additional elements that are related to urban vitality (H. Sung et al., 2015): people's ability to move without depending on a car and the need to be wary of elements and spaces that could be harmful for human activity, for which she coined the term 'border vacuums'.

7.1.2.2. Revisiting urban vitality

Some authors have been critical of the fact that the Jacobs hypotheses of urban design have been widely accepted as good principles, although they have not been scientifically tested (Marshall, 2012). Moreover, in the past decade (approximately) we find an increasing number of studies, from different disciplines, geographical contexts, and also based on different methodologies, that use the principles of Jane Jacobs from an applied perspective to evaluate present-day cities. The majority of studies to date have used the principles of Jacobs as a framework to describe the built environment in order to explore its association with a specific outcome (e.g., mobility levels, safety, health outcomes), while others have aimed at evaluating the adequacy of her principles solely for characterizing present-day cities (J. gang Shi et al., 2019). Both types of studies have used a similar set of concepts in order to describe the built environment under the Jane Jacobs framework, either by directly transforming her ideas to specific variables or by partially including new interpretations of what the conditions for vitality may be in present-day cities. In the following paragraphs we provide some examples of how the Jacobs generators of vitality have either been operationalized, reinterpreted, or expanded in recent studies.

Most studies applying the Jacobs framework to the study of cities have used, to some extent, some measure of concentration. Following the Jacobs rationale, concentration has been generally operationalized as population density (De Nadai et al., 2016; Delclòs-Alió & Miralles-Guasch, 2018b; Q. He et al., 2018; H. Sung et al., 2015), residential density (E. Garcia et al., 2018; Yoon & Park, 2018) or housing density (Faria et al., 2013; Lu et al., 2019; H. Sung et al., 2015). However, there have been other interesting reinterpretations of concentration. For instance, some studies have included other measures such as the density of "points of interest" (Lu et al., 2019; Y. Yue et al., 2017), public facilities (Long & Huang, 2019) and other studies have used stores, bars, or restaurants (March et al., 2012; C. Wu et al., 2018). The presence of

such elements in the urban space has been related to the Jacobs "eyes on the street" concept, meaning that a maintained presence of people creates a sort of "natural surveillance" system that also has been proved to increase safety (Anderson et al., 2012; Faria et al., 2013).

When measuring the need for primary mixed uses, the most common approach in applied studies has been to use land-use mix indices (De Nadai et al., 2016; Q. He et al., 2018; March et al., 2012; Zeng et al., 2018), and also complementary indicators of the balance between residential and non-residential uses (H. G. Sung et al., 2013). Similarly, other studies have gone one step farther and applied this same logic to retail diversity in particular by incorporating mix and balance of business types (H. Sung et al., 2015; Yoon & Park, 2018).

Regarding the need for old and new buildings, some studies have incorporated this variable without change (Delclòs-Alió & Miralles-Guasch, 2018b; H. Sung & Lee, 2015). However, in present-day cities it seems unlikely that the building construction year would be an accurate indicator for housing affordability (King, 2013). In a context where access to affordable housing is becoming increasingly problematic, other studies have suggested using more direct indicators of housing affordability, such as average housing price (Long & Huang, 2019).

Contact opportunity has been generally measured by means of specific street network characteristics. One of the most commonly used variables has been intersection density, considering that a higher number of intersections translates to a larger number of possible itineraries and opportunities to encounter others (C. Wu et al., 2018). Additionally, other studies have also incorporated other notions of what spaces could be attractive for human interaction. In this sense, the presence of street furniture, such as benches, has also been regarded to have an impact on urban vitality (H. G. Sung et al., 2013; X. Xu et al., 2018). This may be particularly relevant for specific population groups such as older adults, who require resting places along their walking itinerary (Borst et al., 2008). Similarly, other authors have drilled deeper into the ideas of Jacobs and highlighted that the presence of small parks and squares may also be regarded as potential forums of social interaction, compared to large public spaces (De Nadai et al., 2016). Lastly, the present-day need for human interaction not only takes place in physical space, but also virtually, and therefore some studies have also considered public internet connectivity in the public space as, in turn, potentially conducive for human physical interaction, especially among young people (Y. L. Kim, 2018).

In terms of accessibility as one of the two complementary conditions for urban vitality, studies have generally referred either to the supply of public transportation, on the one hand, or to walkability conditions, on the other. Related to the former, distance to rail and metro stations, bus stops, bicycle parking, and other transport facilities are often used as indicators of accessibility (Miralles-Guasch et al., 2018; H. Sung et al., 2015). In terms of walkability, it is common to find studies specifically using the existence of sidewalks and their pavement conditions (Faria et al., 2013), the presence of traffic-calming schemes (Lunecke & Mora, 2018), slopes (H. G. Sung et al., 2013) or even street lighting (Jin et al., 2017; Zarin et al., 2015).

Lastly, in terms of the so-called border vacuums, researchers generally refer to monofunctional urban spaces (i.e., large parks), natural elements that could act as barriers (i.e., rivers), and ground-level heavy transportation infrastructures (i.e., railways, roads) (De Nadai et al., 2016; H. Sung & Lee, 2015).

In summary, research efforts applied to the study of urban vitality in today's cities has gained momentum by means of diverse conceptual and methodological approaches. However, we

identified unexplored issues in the literature. First, we found that most contributions used the original theoretical frame of Jane Jacobs for a wide variety of purposes, usually translating it directly to specific variables (such as density of population, land use, or transport accessibility). However, to our knowledge, usually there are fewer studies that actually reinterpreted her ideas or interpreted them with a present-day lens. Moreover, such contributions have only partially revisited the principles of Jacobs by focusing on a particular research field where vitality is measured with specific outcomes, rather than studying urban design from a global perspective. Hence, it is our opinion that there is still a need to bring the principles together in a harmonized manner.

Furthermore, we also identified a gap regarding the geographies, primarily in Asian and North American countries, which previous studies have focused on. To date, little attention has been paid to the European context, and more specifically, to Mediterranean cities. In this line, there is also a matter of what type of urban contexts are analyzed. According to some critical authors, idea of dense according to Jacobs (i.e., lively and diverse neighborhoods) is privileging a "middle class way of life" (Connolly, 2018; Kirby, 2018; Shake, 2015; Steil & Delgado, 2018), forgetting about more disadvantaged socioeconomic realities. In addition, street vibrancy is often identified with compact urban forms corresponding to central cores, while there is less evidence from other urban fabrics, specially focused on peripherical locations. In this sense, there is a need to understand how urban vitality operates in enclaves that present disadvantaged and socioeconomic contrasts, in terms of income and vulnerability indicators, because to date no studies have been developed in these contexts.

In order to address these research gaps, this paper has two primary aims: 1) present a synthetic index to measure the potential of urban vitality, updating the version of the JANE Index developed by Delclòs-Alió & Miralles-Guasch (2018) and considering recent critical suggestions in the literature; 2) assess the potential of this updated index in a case study corresponding to a low-income peripheral district in a Mediterranean city, characterized by presenting diverse social and morphological characteristics.

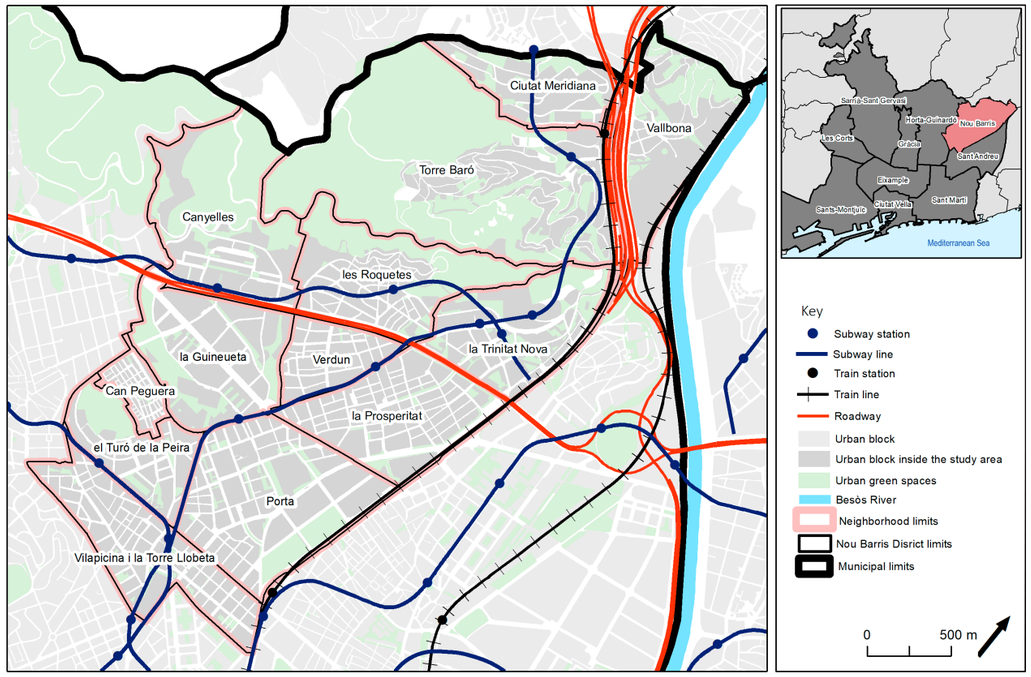
7.1.3. Methods

7.1.3.1. Study area

This study focuses on the Nou Barris district in Barcelona (Spain) (Figure 9). Nou Barris (which presents an area of 804 hectares) is located on the northern side of the city, bordering with the Collserola mountain range (i.e., with an elevation of 512 m at Tibidabo, Barcelona) and it is divided into 13 neighborhoods, with an overall population of 167.868 inhabitants (10.4% of the total City of Barcelona population) (Ajuntament de Barcelona, 2020). The mean of the population density is 20,900 inhab./km2, which is higher than the City of Barcelona average (15,900 hab./km2). The population in Nou Barris is not evenly distributed across its neighborhoods, which can be explained by different historical development patterns.

Until the end of the 19th century, Nou Barris was mostly a rural area with a small town core, corresponding to the present-day neighbourhod of *Vilapiscina i la Torre LLobeta*. With industrialization, the dominant rural landscape started to host small industries and large infrastructures that were relocated on the periphery of the city, where they still remain today. The progressive arrival of the working-class population at the start of the 20th century initially resulted in a scattered urbanization process that resulted in informal slums first, and in low-cost public housing promotions in low-rise dwellings later (popularly known as cheap houses)

Figure 9. Study area: Nou Barris district (Barcelona).



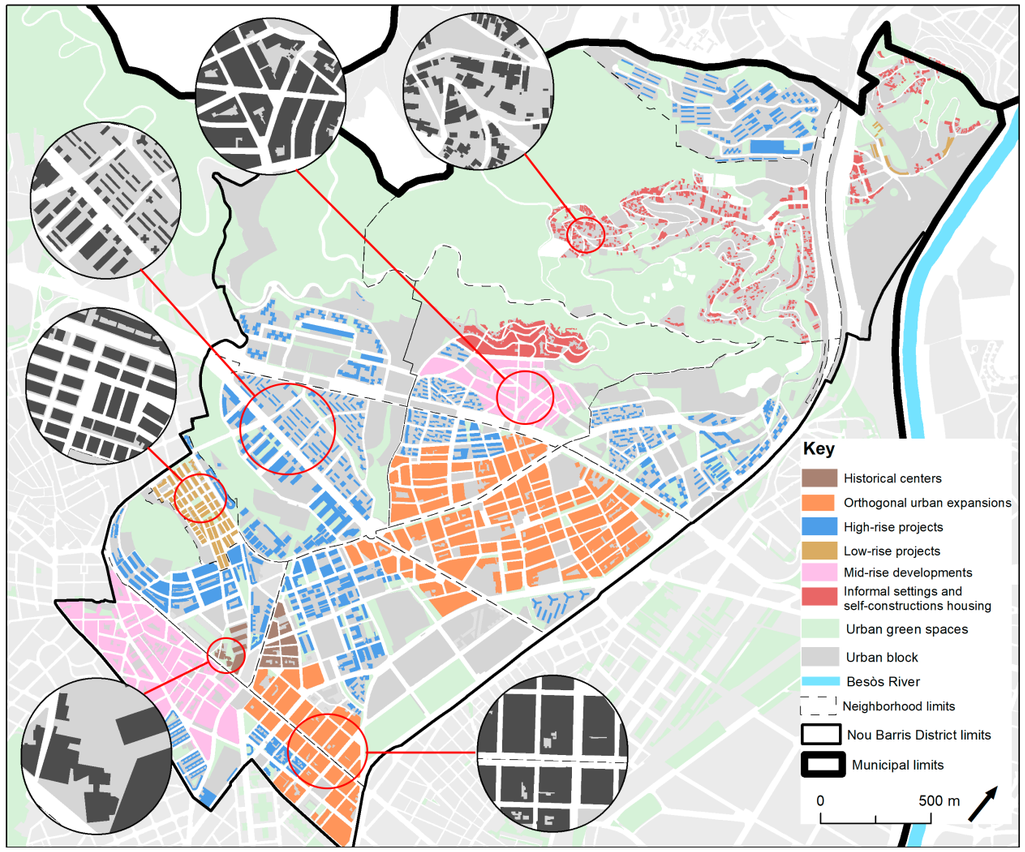
Source: own elaboration.

(García Soler, 1998), located in *Can Peguera*. However, the largest transformations took place between the 1950s and 1970s. Nou Barris grew significantly due to the accommodation of the post-war migration workforce coming from rural areas of Spain. Newcomers established in both self-constructed shanty settlements and, later, in public high-rise housing projects in *Verdum*, *Roquetes*, *Ciutat Meridiana*, *la Guineueta*, *Porta*, *El Turó de la Peira*, and *Canyelles*. These neighborhoods presented severe building inadequacies and almost no connection with the rest of the city (Domingo i Clota & Bonet i Casas, 1998). Improvements were accomplished in the 1980s and 1990s, mainly triggered by community-organized initiatives and demands that crystalized in urban policies such as interventions on housing, public spaces, and the provision of infrastructures that aimed to dignify this traditionally marginalized district (García Soler, 1998). The uneven development patterns of the district resulted in six main types of urban form (Figure 10): a) historical centers; b) orthogonal urban expansions, c) high-rise housing projects, d) mid-rise developments, e) low-rise housing projects, and f) informal settlements of self-construction housing.

7.1.3.2. Variables and data sources

This study is based on the construction of an updated and extended version of the JANE Index, described in a previous work (Delclòs-Alió & Miralles-Guasch, 2018b). We build on the four basic generators of vitality according to Jacobs (concentration, functional diversity, contact opportunity, and need for aged buildings) and two accessory principles (accessibility and distance to border vacuums). In addition, we incorporate other variables based on the recent literature exploring vitality and its drivers under the framework of Jacobs. The result is an updated JANE Index consisting of 22 variables compiled from diverse data sources, as summarized in Table 3.

Figure 10. Urban morphology types in Nou Barris.



Source: own elaboration.

Concentration is measured as the combination of three primary elements. *Population density* (pop./km2) ("DENS") is the primary condition, as the presence of human life was considered by Jacobs as fundamental for vitality. However, in this new edition of the JANE Index we also include an indicator for *commercial density* (retail businesses/km2) ("COM_DENS") and *density of public facilities* (public facilities/km2) ("FACIL_DENS") as both attract the presence of people because they are considered to be points of interest (C. Wu et al., 2018; Y. Yue et al., 2017).

Second, *Functional diversity* is defined as the presence of i) multiple urban functions and ii) a balance between residential and non-residential uses. First, two main indices were calculated: *Building-Use Mix Indicator* (BuMI) index and a *Residential-NonResidential* (RNR) balance index.

$$BuMI = -1\left(\frac{\sum_{i=1}^{n} pi * \ln(pi)}{\ln(n)}\right)$$

BMI is an adaptation of an entropy index calculated by the main six uses extracted from the municipal cadaster (residential, commercial, work-related, recreational, and others), which was calculated with the following expression:

where *p* refers to the proportion of the use *i* in relation to the total possible uses *n*.

The RNR index was created with the following expression:

$$RNR = 1 - \left|\frac{\mathrm{Res}_i - \mathrm{NonRes}_i}{\mathrm{Res}_i + \mathrm{NonRes}_i}\right|$$

where Res_i refers to residential uses and $NonRes_i$ to non-residential uses. Both indices take values from 0 to 1.

Complementarily, in this updated JANE Index, we also considered the diversity of retail and other everyday facilities. Previous studies also pointed out that that diversity per se does not necessarily guarantee the presence of everyday retail and other facilities (Yoon & Park, 2018), and therefore we also included an indicator of the balance between basic and non-basic facilities. These variables were included as two separate indices: *Commercial and Facility Mix* (CFMIX) and a *Basic-Non-Basic Facility* (BNB) balance indicator. The CFMIX index was calculated using the following expression:

$$CFMIX = -1\left(\frac{\sum_{i=1}^{n} pi * \ln(pi)}{\ln(n)}\right)$$

where *pi* refers to the proportion of the activity type *i* in relation to all other possible categories, and *n* is the total number of categories.

The balance indicator between basic and non-basic facilities[1], was calculated using the following expression:

$$BNB = 1 - \left|\frac{\mathrm{Bas}_i - \mathrm{NoBas}_i}{\mathrm{Bas}_i + \mathrm{NoBas}_i}\right|$$

For *Contact Opportunity*, the original index included the indicators of block size and street width. The updated index now considers five different indicators based on recent conceptualizations of what vibrant public spaces may require. First, we include the classical indicators of the built environment such as i) intersection density ("INTERSEC"), and ii) distance to specific meeting points, squares, and pocket parks (Peschardt et al., 2014) ("PPDIST"). We also consider microelements of the built infrastructure that encourage human relationships, such as iii) the presence of street benches ("BENCHES"), especially among seniors (Cao et al., 2019). In order to include new perspectives that have also evidenced vitality occurring in a virtual dimension (Y. L. Kim, 2018), we include an indicator that measures iv) distance to public Wi-Fi hotspots ("WFDIST"). Finally, we calculated v) an indicator of betweenness ("BTW") using urban network analysis tools (Sevtsuk, A.; Mekonnen, 2012) . The betweenness indicator measures

1 Facilities considered as basic: everyday life retail (e.g., grocery stores, supermarkets, bakeries, pharmacies), educational and health facilities. Considered as non-basic or secondary facilities: property business, automotive commerce, personal equipment, cultural, leisure and recreational facilities, household furnishing, reparation (household appliances and automobiles), bars and restaurants, others.

the potential number of people that can go past a given building in a specific radius. In this case we used 600m, which is approximately equivalent to 10 minutes of travel time on foot (Wei et al., 2016), and was calculated with the following expression:

$$BNB = 1 - \left|\frac{\mathrm{Bas}_i - \mathrm{NoBas}_i}{\mathrm{Bas}_i + \mathrm{NoBas}_i}\right|$$

where betweenness of a building *i* is defined as the number of times that the building *i* is situated along the shorter route between all pairs of other buildings in a specific radius *r*. Specifically, *njk* refers to the number of short routes from a building *j* to a building *k* in a radius *r*, and *njk* [i] is a sub-selection of these routes that pass close to *i*, and *W(f)* refers to the weight of each building related to the population in the census.

Fourth, Jacobs highlighted that cities need to ensure buildings with different characteristics are present in order to guarantee a certain degree of socioeconomic diversity. With this intention, we first included the *building mean year of construction* ("YEARM") and the *standard deviation* ("YEARSD") to incorporate diversity of building construction years, which correspond to the original ideas of Jacobs. However, in cities such as Barcelona, housing affordability does not only depend on building age or type, as there are phenomena such as tourism and gentrification affecting housing accessibility (Cocola-Gant & Lopez-Gay, 2020; A. Gutiérrez & Domènech, 2020). For this reason, in this new index we also consider the average rent in the neighborhood in Euros ("RENT") as an updated indicator of housing affordability.

Accessibility is defined by six indicators. The first is measured as the weighted distance to public transport ("TPDIST"), applying a weight system based on the transportation network hierarchy: interurban railway transport (40%), metro and tramway (30%), local bus lines (20%), and bicycle stations (10%). As a novelty, we include a set of five indicators related to pedestrian accessibility (authors): street inclination or slope ("INCLIN"), presence of street lighting ("LIGHT"), distance to the nearest pedestrian crossing ("PVDIST"), the presence of sidewalks ("SWALKS"), and finally, the presence of 30 km/h areas[2] ("30A"), as traffic calming interventions are evidenced to promote pedestrian activity (Barbosa & Baptista Neto, 2015).

Lastly, Jacobs defined the existence of certain uses and elements in the city that she considered detrimental to urban vitality, as they could act as "border vacuums" of human activity. In the present study, we use *distance from border vacuums* ("BVDIST"), considering large single-use buildings (5,000 m^2 and above), large parks (5,000 m^2 and above), large roads at the surface, and include dedicated parking areas and empty lots, regarded as barrier indicators for walking activity (Knapskog et al., 2019).

7.1.3.3. Data processing and calculations

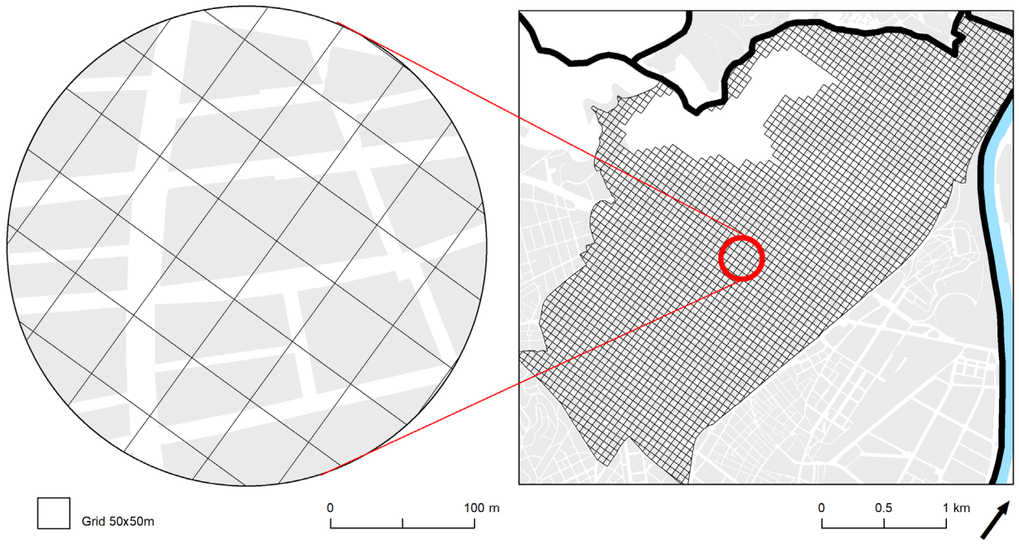
Jane Jacobs suggested that the appropriate scale for the detection and understanding of urban vitality was the street-level perspective. Following this reasoning, after data collection and pre-processing, we summarized the 22 variables in a 50 x 50 m cell grid (Figure 11). This process was conducted to homogenize the spatial resolution of the original data at a scale considered proper for an in-depth analysis of street-level activity (Arranz-López et al., 2017). This is also a novelty related to the previous JANE Index (Delclòs-Alió & Miralles-Guasch, 2018), whose

2 Areas with maximum circulation speed of 30 km/h.

grid was 100 x 100 m, in order to provide a higher resolution and come closer to what actually constitutes the street-level. Each cell is assigned a value for each of the 22 variables, following one of four calculation rules (Table 3): i) *Mean value* in a 100 m radius from the centroid of the cell, ii) *Presence* within the cell (yes or no), iii) *Count* within the cell, and iv) *Distance* from the centroid of the cell to the nearest element.

In order to have comparable indicators for each of the conditions, we standardized the 22 original variables to their corresponding z-scores. The sign of some variables was inverted

Figure 11. Grid of 50 x 50 m cells used in the analysis.



Source: own elaboration.

since they were expected to have an inverse association with vitality. To calculate scores for each of the six conditions, we created a weighted sum according to the expected relevance of each of the variables for each specific condition.

In terms of concentration, starting with an 'equal-weights' logic, we granted a slightly larger weight to population density (4/10), as it is the basic condition for vitality according to Jacobs, compared to commercial and facility density (3/10 each), as described by the following expression:

Concentration (C) = *zDENS* (4/10) + *zCOM_DENS* (3/10) + *zFACIL_DENS* (3/10)

For *functional diversity* the main weight is granted to the building-use mix indicator (3/10) and to its complementary variable that captures the balance between residential and non-residential uses (3/10), since these two indicators represent the backbone of what constitutes a balanced land-use mix in a certain urban area, and are the two most common indicators used in similar studies (De Nadai et al., 2016; H. Sung et al., 2015). On a second level, commercial and facility mix and the indicator for balance between basic and non-basic retail and facilities are given a weight of 2/10. The expression is as follows:

Functional diversity (FD) = *zBuMI* (3/10) + *zRNR* (3/10) + *zCFMIX* (2/10) + *zBNB* (2/10)

For *contact opportunity*, the largest weight is attributed to the structural elements of built environment, that is, to the presence of intersections (3/10) and betweenness (3/10), followed by the presence of pocket parks (2/10), and lastly micro elements of urban space, such as benches (1,5/10) and presence of Wi-Fi hotspot (0,5/10), since these are especially attractive to specific population groups. The resulting expression is:

Contact opportunity (CO) = *zINTERSEC* (3/10) + (-1)*zPPDIST* (2/10) + *zWFDIST* (0,5/10) + *zBENCHES* (1,5/10) + *zBTW* (3/10)

For *building diversity*, the main weight (6/10) is given to the original ideas of Jacobs, regarding both the age of buildings (3/10) and its diversity (standard deviation) (3/10). Secondly, in order to nuance the effect of the previous two indicators, we included a rental price mean indicator with a weight of 4/10. It is described by the following expression:

Building diversity (BD) = (-1)*zYEARM* (3/10) + *zYEARSD* (3/10) +(-1)*zRENT18* (4/10)

For *accessibility*, the weighting scheme is based on spatial access related to each transportation mode (i.e., transportation modes that allow for greater spatial accessibility levels are granted larger weights), organized as follows: train, subway, bus, and shared-bicycle system. For the *pedestrian accessibility*, the largest weight is given to street slope (2/10), followed by the remaining street design elements such as street lighting (1/10), the presence of sidewalks (1/10), and pedestrian crossings (1/10), and lastly to the presence of 30km/h areas (1/10). The expression is as follows:

Accessibility (A) = (-1)*zTPDIST* (4/10) + *zINCLIN* (2/10) + *zLIGHT* (1/10) + *z30A* (1/10) +(-1)*zPVDIST* (1/10) + *zSWALKS* (1/10)

Finally, for *border vacuums* the same weight was granted to all elements that could be considered to discourage urban vitality (large single-use buildings of 5,000 m^2 and above, large parks of 5,000 m^2 and above, large roads at ground level, dedicated parking areas and empty lots):

Border vacuums (BV)= zBV

Lastly, we calculated an updated JANE Index by creating a weighted sum of the conditions, while making a distinction between the basic and complementary conditions for vitality by assigning different weights (H. Sung et al., 2015):

JANE = C (1/5) + FD (1/5) + CO (1/5) + BD (1/5) + A (1/10) + BV (1/10)

Table 3. Conditions and indicators used in the analysis.

Conditions	Indicators	Description	Original resolution	Calculation rule
Concentration (C)	DENS	(1) Population density (hab./km2)[a]	Block	Mean (100 m radius)
	COM_DENS	(2) Commercial density (retail businesses/km2)[b]	Points	Mean (100 m radius)
	FACIL_DENS	(3) Public facilities density (public facilities/km2)[b]	Points	Mean (100 m radius)
Functional diversity (FD)	BuMI	(4) Building-Use Mix Indicator (0-1)[c]	Cadastral plot	Mean (100 m radius)
	RNR	(5) Residential-NonResidential balance (0-1)[c]	Cadastral plot	Mean (100 m radius)
	CFMIX	(6) Commercial and Facility Mix (0-1)[b]	Points	Mean (100 m radius)
	BNB	(7) Basic-NonBasic commercial and facility balance (0-1)[b]	Points	Mean (100 m radius)
Contact Opportunity (CO)	INTERSEC	(8) Intersection density[d]	Points	Count
	PPDIST	(9) Distance to squares and pocket parks (m)[e]	Polygons	Distance
	WFDIST	(10) Distance to public Wi-Fi hotspots (m)[f]	Points	Distance
	BENCHES	(11) Benches[g]	Points	Count
	BTW	(12) Betweenness[a]	Block	Mean (100 m radius)
Building diversity (BD)	YEARM	(13) Building average year of construction[c]	Cadastral plot	Mean (100 m radius)
	YEARSD	(14) Diversity of building year of construction[c]	Cadastral plot	Mean (100 m radius)
	RENT	(15) Average neighborhood rent (€)[h]	Neighborhood	Mean (100 m radius)
Accessibility (A)	TPDIST	(16) Weighted distance to public transport stations/stops (m)[i]	Points (stops and bicycle stations)	Distance (weighted)
	INCLIN	(17) Street slope (º)[j]	Street-level	Mean (100 m radius)
	LIGHT	(18) Street lighting [g]	Points	Count
	30A	(19) Presence of 30 km/h areas[k]	Polygons	Presence
	PVDIST	(20) Distance to pedestrian crossings (m) [g]	Polygons	Distance to nearest
	SWALKS	(21) Presence of sidewalks[g]	Lines	Presence
Border vacuums (BV)	BVDIST	(22) Distance to large single-use buildings, large parks, surface large roadways, parking areas, and empty lots (m)[e]	Polygons	Distance to nearest

Data sources: [a]City blocks urban data 2016, Barcelona City Council, [b]Retail inventory of the City of Barcelona 2016, Barcelona City Council, [c]Municipal cadaster 2017, Ministry of Treasury, [d]Road Graph by street section 2019, Barcelona City Council, [e]Land use cartography 2016, Barcelona City Council, [f]Wi-Fi public spots 2019, Barcelona City Council, [g]Topographic municipal map at 1:1000 scale 2018, Barcelona City Council, [h]Rental Market in Barcelona neighborhoods 2018, Barcelona City Council, [i]Public transport stops and bike-sharing stations (Bicing) in Barcelona 2019, Barcelona City Council, [j]Terrain elevations model 15 x 15 m 2019, Cartographic and Geological Institute of Catalonia ,[k]30 areas in the City of Barcelona, Barcelona City Council.

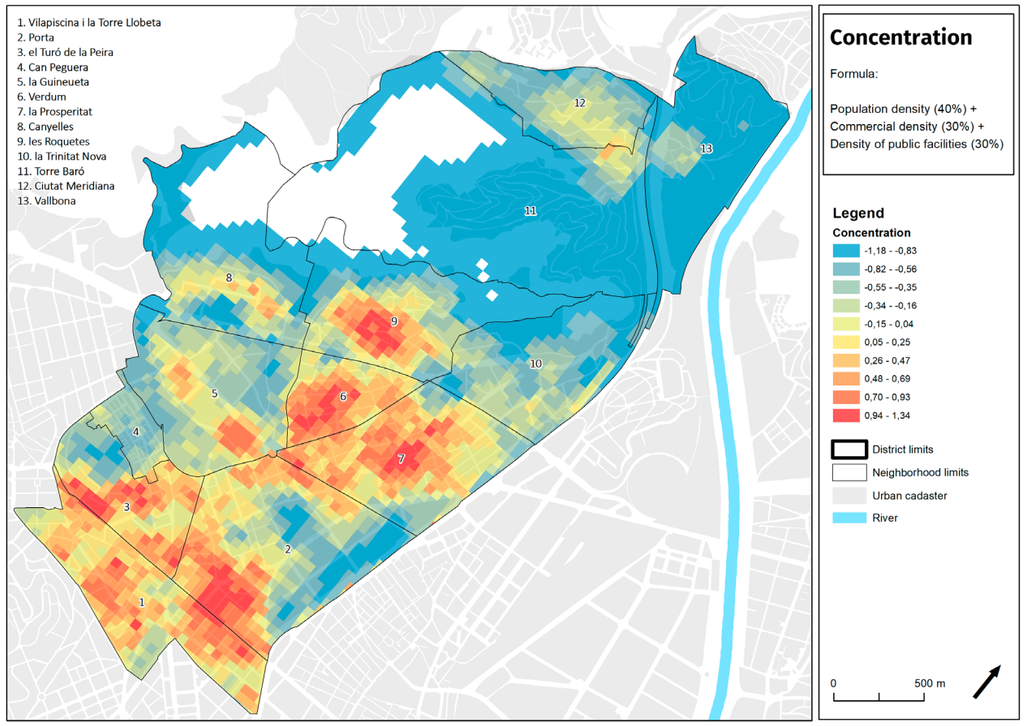
7.1.4. Results

The results of measuring the conditions for urban vitality in the study area are shown in Figures 12-17. We first present each of the conditions separately and then describe the final result synthesized by means of the updated JANE Index.

7.1.4.1. Concentration

High *concentration* values were found where high values of population, commercial and facility density overlap (Figure 12). This is mainly the case for old historical cores (such as in *Vilapiscina i la Torre LLobeta* neigborhood), areas of orthogonal expansion (i.e., *La Prosperitat*, or *Verdum* neighborhoods) and areas dominated by high-rise housing projects (i.e., *Canyelles*, *Ciutat Meridiana*, *la Guineueta*). Low concentration values were mainly identified in areas located along the mountainous area in the north of the district. These correspond to neighborhoods with a high presence of self-construction housing, especially in *Torre Baró*. However, we also observed low concentration spots within the main urban footprint. These mainly correspond to large parks and to *Can Peguera*, a very singular neighborhood consisting in a low-rise housing project.

Figure 12. Concentration values in Nou Barris.



Source: own elaboration.

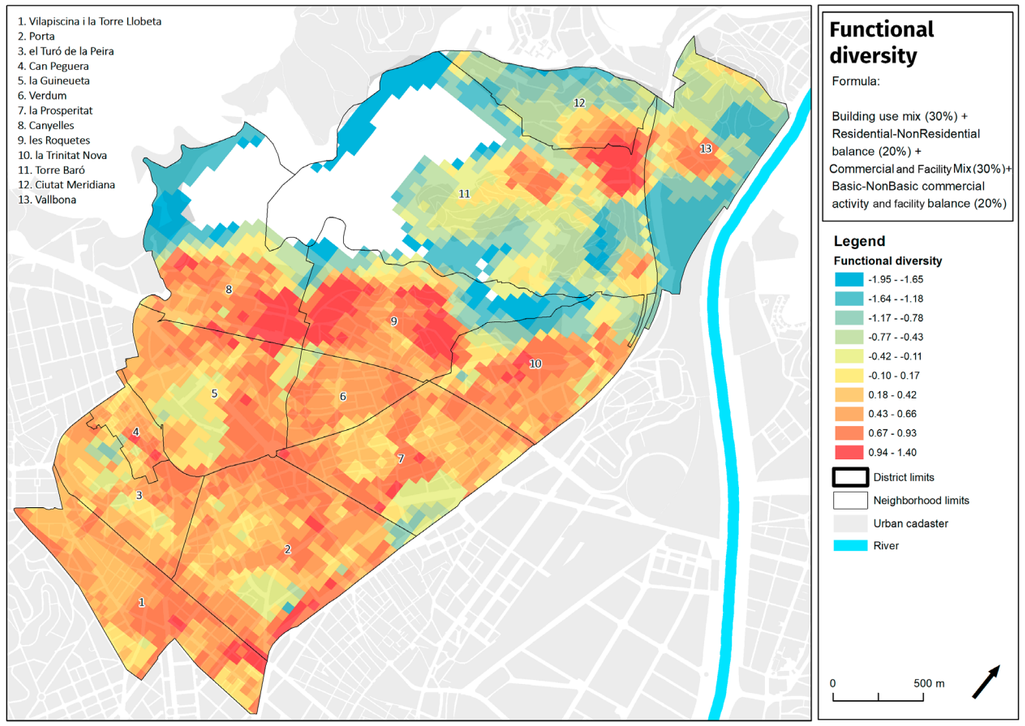
7.1.4.2. Functional diversity

The spatial distribution of *functional diversity* in Nou Barris is shown in Figure 13. In an approximate estimation, high values of functional diversity were found throughout the district.

Specific very high-value poles were mainly identified in neighborhoods forming a parallel line to the ring road (in *Canyelles* and *Roquetes*), in the north, around the train station of *Torre Baró*, and in the south east, close to a shopping center (in *Porta*). High values were also found in the central neighborhoods, following the patterns formed by the main promenades of the district (*Vía Júlia*, *Passeig de Fabra i Puig* or *Passeig de la Valldaura*), which gather around a variety of local shops, bars, civic facilities, and other services.

Low values of functional diversity were primarily found in spaces characterized by single-use developments and mountainous areas. Regarding the former, it is specifically the case of an agricultural land situated on the eastern side of *Vallbona*, close to the *Besòs* river, and an open-air parking area and energy infrastructure facilities in the north of *Trinitat Nova*. Proximity to mountainous territories also discourages the locations of residences and therefore of mixed services, which occurs in the northern neighborhood borders of *Torre Baró*, *Roquetes*, and *Canyelles*.

Figure 13. Functional diversity values in Nou Barris.



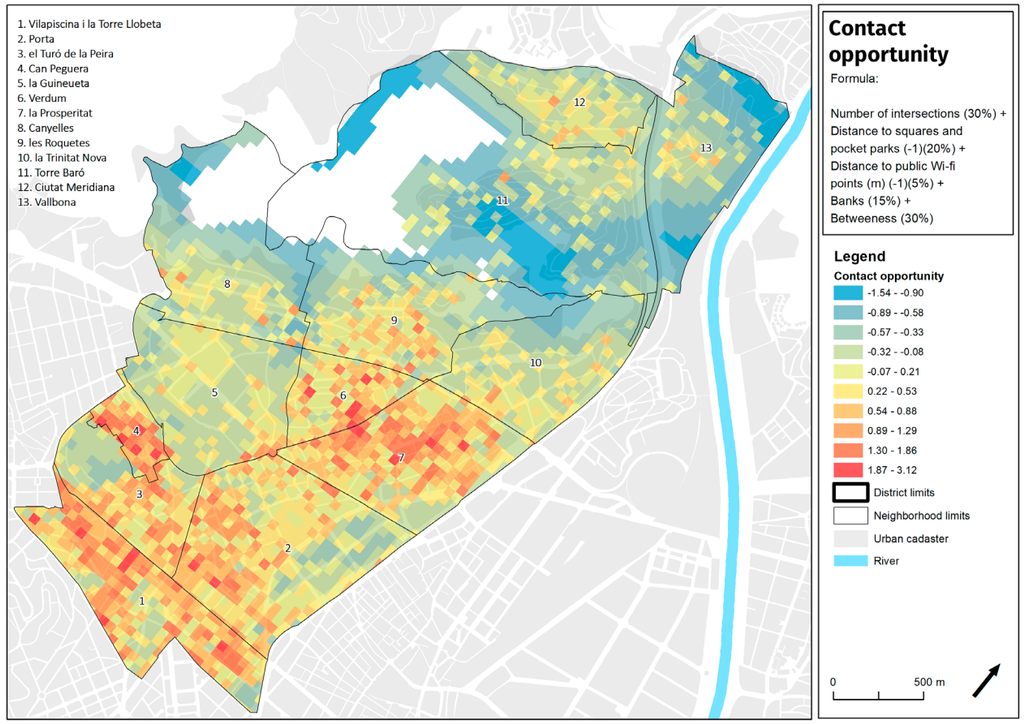
Source: own elaboration.

7.1.4.3. Contact opportunity

The distribution of places that provide *opportunities for contact* in Nou Barris are shown in Figure 14. In general, we observed that areas with a higher degree of compacity generally provide more contact opportunities. This is mainly the case with historical cores (*Vilapiscina i la Torre LLobeta*), the orthogonal street pattern areas (i.e., *La Prosperitat* and *Verdum*), and the singular case of *Can Peguera*, which is characterized by a high intersection density in combination with a significant presence of meeting points such as squares or pocket parks. Conversely, the dominance of winding streets and the lack of walking infrastructure in large

parts of the hilly neighborhoods of *Torre Baró* and *Vallbona* explain the low contact opportunity values in these areas.

Figure 14. Contact opportunity values in Nou Barris.



Source: own elaboration.

7.1.4.4. Building diversity

Regarding *Building diversity* (Figure 15), most of Nou Barris generally showed medium values. However, we observed that the diversity of edifications was higher in specific areas. This was the case of the central historical cores (*Vilapiscina i la Torre LLobeta*, *el El Turó de la Peira*, and *Porta* neighborhoods), where many of the oldest buildings in the district are present. We also found a singular spot in the north-west part of *Canyelles*, where an ancient ensemble of old constructions is located which were originally part of a hospital and are currently preserved by a community-based project. The case of *Can Peguera* is remarkable too, as the neighborhood, originated by the construction of a public housing project, still remains in a public tenancy regime, having the most affordable housing prices of the district. Lastly, it is also noteworthy that lower rent prices explain how, in general, northern neighborhoods such as *Torre Baró*, *Trinitat Nova* and *Vallbona* presented values above the average for this indicator.

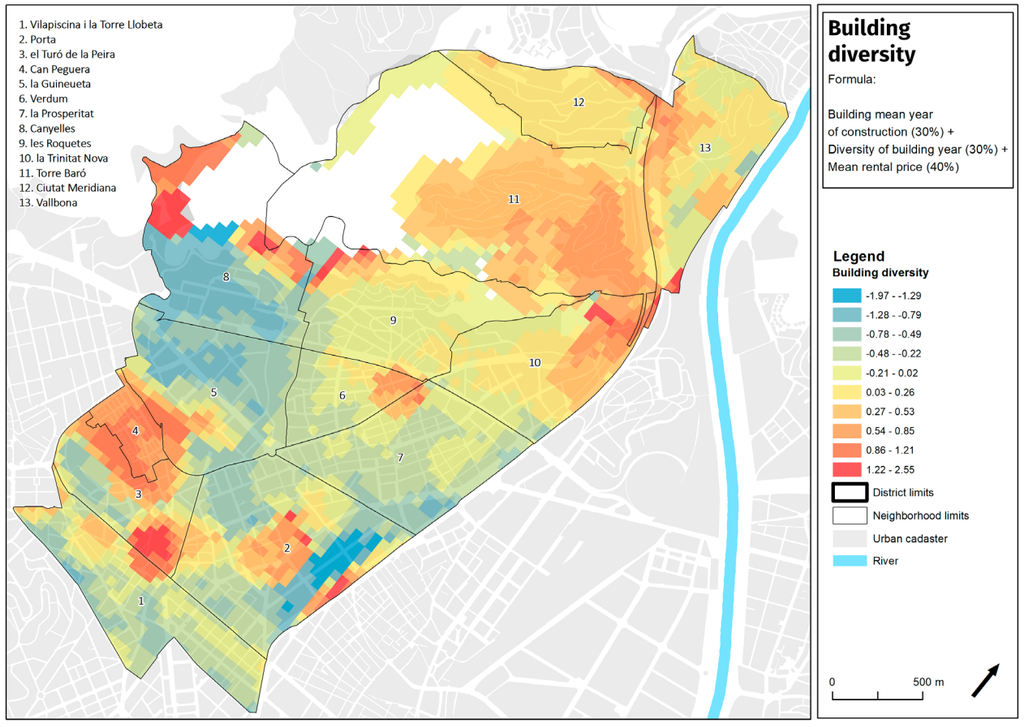
7.1.4.5. Accessibility and distance from border vacuums

The two accessory conditions to the Jacobs theory, *accessibility* and *distance from border vacuums*, are presented in Figure 16. In broad terms, the central area of the district presents higher accessibility values. These results were mainly driven by higher degrees of public transport access, due to the closer distance to one of the main train stations in Barcelona, *Sant Andreu Arenal.* In addition, central neighborhoods are also characterized by lower slopes, the

presence of traffic-calming areas, and a higher density of pedestrian crossings. The second pole of accessibility is identified in the northern side of the district. Despite a challenging terrain, with sinuous and sloping streets, there is a high degree of accessibility explained mainly by the location of another major train station that connects the three northern neighborhoods (*Vallbona*, *Torre Baró*, and *Ciutat Meridiana*) with other parts of the city and also to other municipalities in the Barcelona Metropolitan Area.

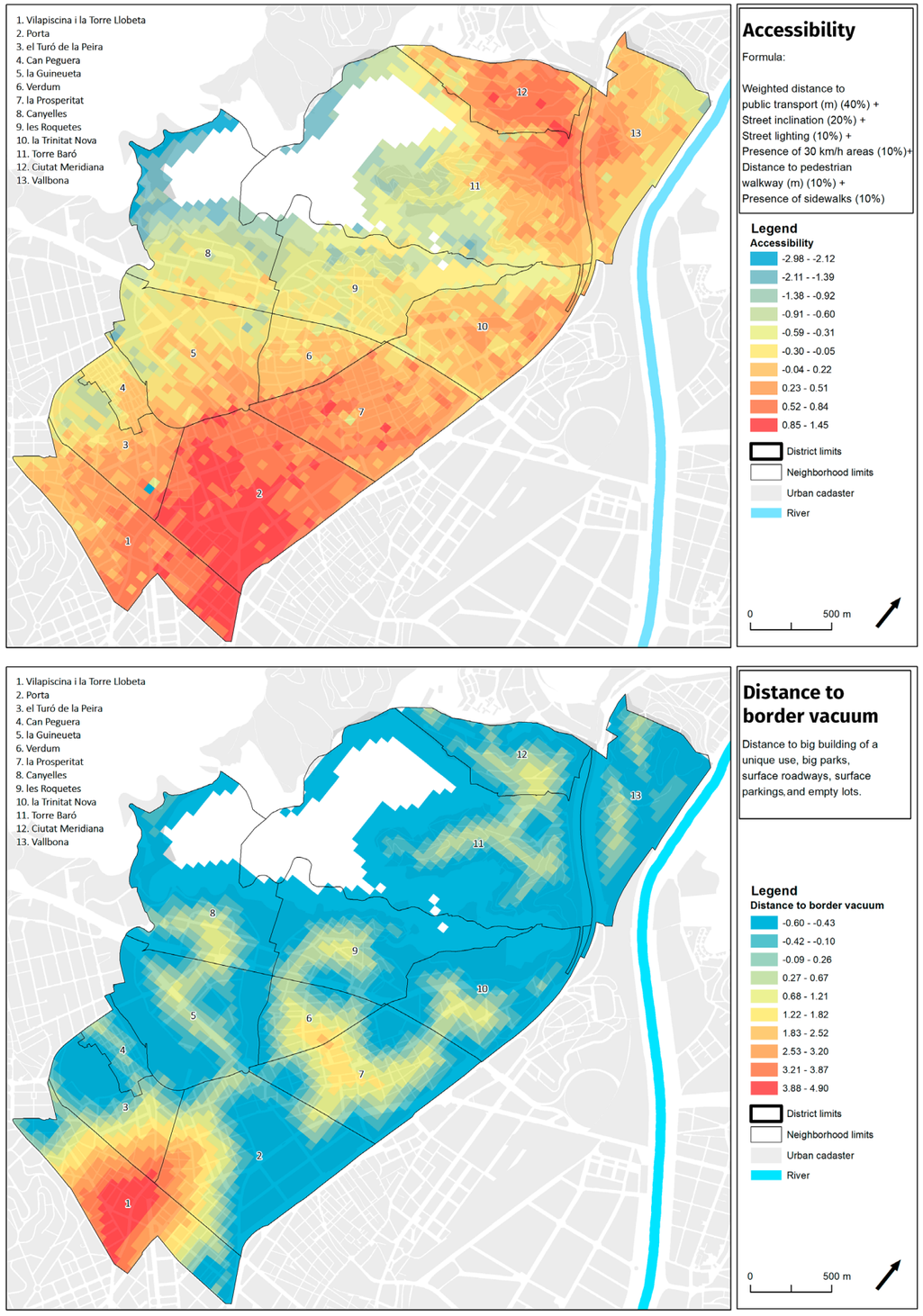
In terms of border vacuums, we mostly found them in the peripheral areas of the district. First, along the mountainous area of Collserola. Second, along major roads such as the *Ronda de Dalt*, which crosses through the neighborhoods of *Canyelles*, *Roquetes*, and *Trinitat Nova*, and also the Avinguda Meridiana, which borders the eastern side of the district from North to South. We also found border vacuums within the urban fabric: a cemetery and a shopping centre in *Porta*, an empty lot used for parking and energy and water supply infrastructures located in *Trinitat Nova*. Conversely, the spots farther away from border vacuums are mainly located in the old town cores (in Vilapiscina i Llobeta) or inside high-rise housing projects (in La Guineuta).

Figure 15. Building diversity values in Nou Barris.



Source: own elaboration.

Figure 16. Accessibility (top) and border vacuum (bottom) values in Nou Barris.



Source: own elaboration.

7.1.4.6. The Jane Index in Nou Barris

As the final step in the analysis, we synthesized the six conditions of urban vitality in an updated JANE Index. Higher values of the JANE Index correspond to areas with a higher potential for urban vitality, while lower values indicate the lack of such conditions. The spatial distribution of the index results in Nou Barris is presented in Figure 17, first showing the crude results (Figure 17, top), and then the categorized version of the index (Figure 17, bottom), on which we will base our description.

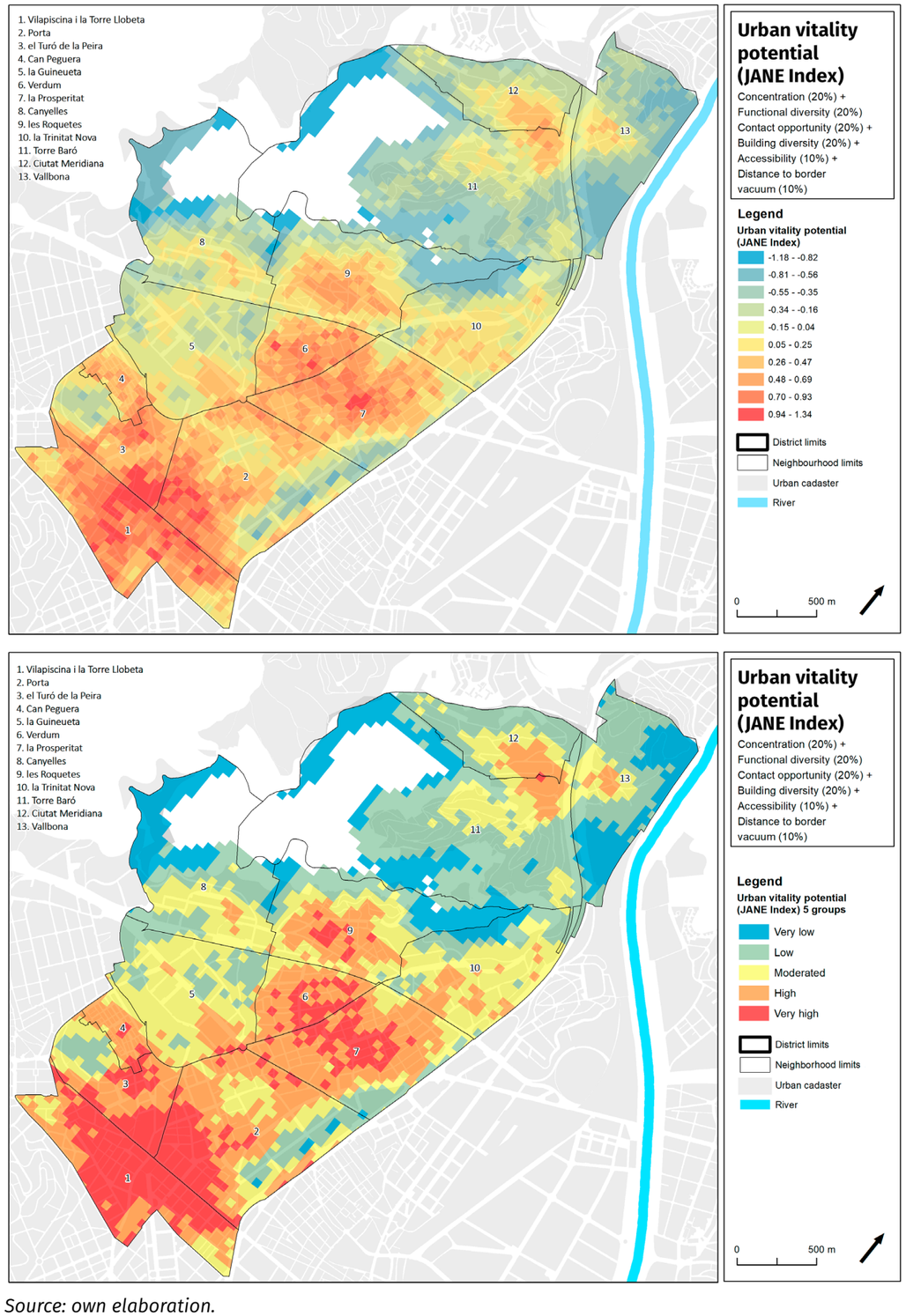
The potential of urban vitality in Nou Barris presents a polycentric pattern, as we find high values of the JANE Index distributed in different sub-centers of potential vitality. In turn, different intensities of urban vitality potential are identified.

Areas with a very high vitality level cover 13% of the study area and are surrounded by high vitality rings, with this second category corresponding to 22% of the analyzed territory. We find these spots in diverse urban environments, which share high scores of most of the vitality dimensions. The largest being in the south of the district, around the historical fabric of *Vilapiscina i la Torre LLobeta* and following the main promenades of *Passeig de Fabra i Puig* and *Passeig de la Peira*. This area is characterized by the presence of older buildings and a mix of commercial and public facilities, resulting in high diversity and accessibility values, which are further enhanced by larger distances to border vacuums. In the center of the District we find a considerable extent of high vitality values structured around the avenue of *Via Júlia*, a civic axe where the *Verdum* and *La Prosperitat* neighborhoods converge. This sector scores high due to a high concentration and a higher relevance of pedestrian-oriented streets and meeting places, such as pocket parks and squares, which manifest in higher levels of contact opportunity. Additionally, in the unique urban context of the *Can Peguera* neighborhood, an old and affordable public low-rise housing project laid out in compact and orthogonal street distribution, we observed higher values of contact opportunity and building diversity. We also identified high-vitality spots in peripheral and sloping areas of the district, such as in the center of *Roquetes*, where functional diversity stands out, as a wide diversity of public facilities come together. Lastly, in the northern neighborhoods of *Torre Baró* and *Ciutat Meridiana*, high vitality is also to be found around the train station and the civic square, scoring highly mainly in terms of accessibility.

The moderate vitality category takes up approximately 25% of the analyzed territory, and it was primarily found in two specific urban contexts. On the one hand, in high-rise housing projects in *La Guineueta*, *Canyelles*, and *Trinitat Nova*, whose areas between blocks are equipped with pocket parks, benches, and green spaces, becoming conducive scenarios of social interaction. We also found considerable values of functional diversity explained mainly by the combination of residential, retail, and recreational uses. On the other hand, we identified moderately vital spaces in hilly and sinuous streets, mainly in the *Torre Baró* neighborhood. Despite the obstacles of the territory, the presence of urban elements such as public transport facilities and basic services (and hence accessibility and functional diversity) makes them urban spaces with an intermediate potential of urban vitality.

Lastly, low and null vitality environments represent 27% and 13% of the studied area, respectively. Both categories are present mainly near administrative district limits, but also, and interestingly, embedded within the urban fabric. The first situation corresponds to areas situated in the north, presenting very low values of accessibility, as they are close to the mountainous areas with pronounced slopes. Regarding the low and non-vital spots in central

Figure 17. JANE Index: crude (top) and categorized results (bottom) in Nou Barris.



Source: own elaboration.

areas, they correspond mainly to monofunctional uses, tightly related to elements identified as border vacuums. This is the case with the great parks of the district and heavy ground-level infrastructures (such as the cemetery, sport facilities, and parking plot).

7.1.5. Discussion

This paper aimed to propose a recontextualization of the Jane Jacobs principles of urban vitality by means of an applied study. As vitality is considered a key indicator of wellbeing and quality of life among urban residents (M. N. Lopes & Camanho, 2013), this study contributes to the discussion about the nature of the drivers of urban vitality and how they are distributed in space. To do so, the study creates a synthetized index that builds on what was developed previously (Delclòs-Alió & Miralles-Guasch, 2018a) and integrates theoretical and methodological suggestions made by the recent literature on the topic. The new updated JANE Index, composed of 22 variables and operationalized using a GIS-based process, is then applied to Nou Barris, a low-income peripheral district of Barcelona (Spain) with diverse morphological characteristics.

The results have evidenced that the conditions for urban vitality in a present-day city are not necessarily related to centrality, specific urban fabrics, or certain level of income, but instead, they can be the result of different combinations of certain urban features. In this sense, this study challenges the widely-held assumption that the highest levels of street activity and vitality are mostly found in inner-city districts, which are normally characterized by higher population densities and mixed uses (E. Garcia et al., 2018). Contrary to what occurs in other contexts where outer-city sectors are almost exclusively residential in terms of land use (De Nadai et al., 2016; Fuentes et al., 2020; Jin et al., 2017), the City of Barcelona presents a homogenous high level of density of population associated with a high provision of services and retail shops that are also in peripheral and low-income neighborhoods. Hence, urban vitality here follows a polycentric pattern. The city's decentralized provision of everyday facilities such as public markets, which in this district are evenly distributed across the outskirt neighborhoods and their coexistence with a dense network of local businesses (Fava et al., 2016), activate proximity and vital dynamics (Marquet & Miralles-Guasch, 2015).

Different intensities of vitality potential are distributed throughout the district, displaying a polycentric pattern and covering a range of diverse urban fabrics. As expected, one of the main areas with high values of urban vitality potential corresponds to the historical core of Nou Barris, which fosters all the basic drivers for vitality. Neighborhoods with orthogonal street patterns also seem to foster the conditions for urban vitality. As is maintained by Jacobs (1961), high population densities combined with a mixture of land uses and meeting points (pocket parks, squares) and intersections, result in such a compact and intricate morphology that provides citizens with a constant opportunity for contact, as well as a diverse provision of facilities and businesses (Banai, 1998; Long & Huang, 2019).

However, in the case of Nou Barris it is especially noteworthy to observe how both moderate and high values of potential vitality were also found in unexpected and remote urban sectors, such as housing projects and areas within challenging slopes. This is the case of some of the northern neighborhoods, which for many years remained isolated due to their hilly nature and the barrier effect of heavy transport infrastructures. Strong neighborhood community mobilizations, together with the application of urban local policies during the recovery of democracy after 36 years of dictatorship, 1939-1975, under the Franco regime (and especially during the 1980s in preparation for the 1992 Barcelona Olympics), were crucial to equip these

original-thinking residential neighborhoods with basic urban facilities (e.g., markets, schools, civic centers, public transportation), achieving considerable levels of diversity and accessibility (Blanco, 2009; Domingo i Clota & Bonet i Casas, 1998). In addition, housing affordability still plays a special part in the interpretation of certain values of vitality in the district. Despite the rental price bubble that Barcelona is currently experiencing (Blanco-Romero et al., 2018), certain neighborhoods in the area correspond to the most affordable rental prices of the City of Barcelona (Observatori Metropolità de l'Habitatge a Barcelona, 2019). Furthermore, high values of urban vitality were found even in high-rise housing projects, one of the development models that Jacobs opposed the most in her time. In the case of such projects in Nou Barris we found that high potential for vitality could be explained by the combination of the intrinsic high residential density of such projects, the particular provision of inner pocket parks, compact pedestrian-oriented environments (intra-block spaces with a minimal presence of motorized transport, and a high potential for social interaction) and especially their combination with a significant level of accessibility that avoids the isolation effect which many other projects suffered from in the 20th century (Baldwin et al., 2018).

The rationale of Jacobs enables us to acknowledge that certain urban features may be regarded as promoters of vibrancy in neighborhoods that have been generally regarded as vulnerable (Cornado et al., 2017). Specifically, following the inclusion of complementary indicators in the updated version of the JANE Index, such as the provision of facilities, basic services, housing affordability, and pedestrian accessibility, it is now possible to recognize nuances in relation to the potential of urban vitality. For example, this is the case of high- and low-rise housing projects, which presented lower scores of urban vitality potential if the abovementioned factors were not considered. Although it is true that these urban areas deal with socio-economic challenges (Antón-Alonso & Porcel, 2018), we may appreciate some of the strengths the built environment offers when designing policies that aim to ameliorate life conditions of residents. As suggested by recent studies, these housing projects offer an urban form with open spaces that could potentially meet present-day car-free urban interventions reclaiming space for people and active sustainable lifestyles (García-Pérez et al., 2020).

In this sense, the ideas of Jacobs offer an interesting framework to address some of the challenges faced by cities in the 21st century in terms of health, sustainability, and equity. Proximity and pedestrian-oriented environments as found in Nou Barris may contribute to better health and safety outcomes (Giles-Corti et al., 2016; Nieuwenhuijsen, 2018). Urban vitality through the lens of Jane Jacobs may also be relevant in order to re-think cities from a gender perspective, since the idea of "*eyes on the street*" (which mainly translates to higher levels of safety resulting from the presence of people and strong social networks) (Humphrey et al., 2017), combined with access to care facilities encourage the use of public space by women (Khalili & Nayyeri Fallah, 2018; van den Berg, 2018). Finally, we may retake the concern of Jacobs on guaranteeing affordability in order to find different kind people living in neighborhoods. In this sense, a range of housing accessibility indicators should be considered when designing urban policies that are able to guarantee diversity. In this study we included an indicator for the average price of rent, which is not sufficient to guarantee housing access. Nou Barris, despite being one of the most low-priced districts of the City of Barcelona in terms of housing, does not ensure affordable housing, as it is also one the areas with major vulnerability related to housing exclusion (Toma, 2018), being affected by evictions (A. Gutiérrez & Domènech, 2018) and a precarious physical state of the buildings (Cornado et al., 2017).

The findings of this study may have relevant implications for future practice, as they can be used to develop targeted interventions in different urban contexts. We identify two main directions

in which urban policies should move towards. First, in areas that do not seem to gather the theoretical conditions for vitality, policies should focus on improving the conditions that may be missing. In the specific case of Nou Barris, northern areas seem to require improvements in terms of pedestrian accessibility together with a considerable potential for increasing density. Second, in areas that already present a considerable potential for vitality, efforts should be aimed at preventing the unwanted collateral risks of vitality, and thus aim to avoid the deaths of these areas due to their own success (Romagnoli, 2020), that is, to guarantee that vital spaces are not triggering pernicious dynamics of social exclusion, as is already happening in certain parts of the City of Barcelona, outside of the district (Cocola-Gant & Lopez-Gay, 2020). In Nou Barris, this is especially the case with southern neighborhoods. One of the main vectors to correct or address such processes corresponds to efforts aimed at guaranteeing housing affordability; for instance, by deploying rent control or increasing the supply of public housing options (Observatori DESC, 2020).

This paper presents some limitations that could inform future studies. First, from a methodological perspective, our approach is limited by the inherent constraints of synthetic indices of this nature. Our calculations were based on a selection of key variables that were integrated by means of a specific combination of weights which, despite being grounded in theory and the previous literature, could be modified depending on the territorial context. Second, our approach could also be limited conceptually. The index presented in this paper offers a static vision of the conditions of vitality, a screenshot of certain aspects of the built environment, while other authors have pointed to the need to adopt a more dynamic perspective (C. Kang et al., 2020). That is, to explore how urban spaces are occupied and used differently throughout the day and by different social groups. This would call for an exploration of how such conditions may vary over time and would be based on the characteristics of urban residents. Similarly, the so-called "relational wellbeing" approach (Pérez del Pulgar et al., 2020), derived from the analysis of social relationships and connections that can take place in public space, could also be relevant when studying urban vitality. Lastly, in this line, our study has paid a limited attention to the interaction between vitality and socio-economic vulnerabilities. In this sense, future studies may explore the complex relationship among the physical environment and social aspects by using the proposed framework.

Despite these limitations, we believe this study can be regarded as a useful tool to re-think the characterization of the built environment using the rationale of Jane Jacobs in contemporary cities. Hence, we have established a framework that may allow fellow researchers and practitioners to determine the potential of urban spaces to be vital, contributing to a wider discussion about what constitutes a vital city, in this case specifically applied to the Mediterranean context. Results found here can be taken as a departure frame for future research to launch deeper analysis from specific approaches using data from other urban phenomena. Finally, the replicability of the JANE Index, as one of the main strengths, may allow to calculate and quantify the potential of vitality in other urban contexts.

Capítulo 8

La relación espacial entre la vitalidad urbana y las realidades cotidianas

8.1. Are vital neighbourhoods socially privileged? Exploring the spatial relationship between urban vitality and urban vulnerability

Gómez-Varo, I., Delclòs-Alió, X., Miralles-Guasch, C. & Marquet, O. (*forthcoming*) Are vital neighbourhoods socially privileged? Exploring the spatial relationship between urban vitality and urban vulnerability.

Enviado a la revista *Local Environment* en fecha 18/12/2022.

8.1.1. Introduction

After decades of urban planning practices based on land use segregation, suburbanisation, and large-scale projects that implied a car-dependent mobility, we are experiencing a paradigm shift, within which proximity is undergoing a revival (Pozoukidou & Chatziyiannaki, 2021). In recent years, urban policies are promoting proximity dynamics by investing in accessibility and pedestrian-oriented developments, as they contribute to resolving some of our current urban challenges in environmental, social, and health terms (Solá & Vilhelmson, 2018b). One of the main inspirations for the promotion of proximity environments would be the theoretical contributions of the American-Canadian urban theorist, Jane Jacobs (1916-2006), which focused on the street level and human activity, using a micro-scale perspective, which she termed as urban vitality.

Urban vitality describes a quality of urban environments that are full of street buoyancy, which are able to gather diverse types of people and activities at different times of the day. In her most celebrated book, *The Death and Life of Great American Cities* (1961), Jacobs theorised about the built environment characteristics that contributed to street *life*, and also those which discouraged human activity. Jacobs defined four main basic conditions for vitality: concentration, diversity, contact opportunity, and the need for buildings with different characteristics. *Concentration* is a prerequisite condition, as a certain level of densities - of population and activities - is needed to guarantee urban vitality. *Diversity* refers to having mixed-use spaces that can host diverse activities throughout the day, thus attracting people with different needs and purposes. A human-scale urban design that promotes *contact opportunity* is another condition, as it boosts social interaction and the existence of the so-called "*eyes on the street*", an informal surveillance created by human co-presence that

contributes to neighbourhood safety. Jacobs argued that vital neighbourhoods also need a certain level of social mixture, which was achieved by the presence of *buildings of different ages* that would offer diverse rent ranges, thus attracting people with different socioeconomic backgrounds. Added to these four conditions, Jacobs also mentioned two additional elements that are related to urban vitality: the *accessibility* of urban spaces, which should be walkable environments with a high coverage of public transit; and the presence of *border vacuums*, those elements and urban spaces that discourage human activity, such as large infrastructures.

In recent years, there has been a growing interest in understanding these theoretical conditions for urban vitality with an applied perspective (J. gang Shi et al., 2019). Using the frameworks of diverse disciplines and contexts, most previous works have characterised the built environment of today's cities according to the original principles of urban vitality of Jacobs (De Nadai et al., 2016; Delclòs-Alió & Miralles-Guasch, 2018b; C. Kang et al., 2020; Lunecke & Mora, 2018; H. G. Sung et al., 2013). More recently, new contributions have aimed to revisit Jacobs theories, by taking into account current urban contexts, and then adapting her ideas of what contributes to vibrant city life today (Eom et al., 2022; Gómez-Varo et al., 2022; Jiang et al., 2022; W. Yue et al., 2021; Ziya Paköz et al., 2022).

Urban vitality is widely considered as an indicator of good urbanism, as it has the potential to improve the quality of life (Braun & Malizia, 2015). This can be particularly relevant for urban policies aimed at vulnerable population groups, which can counteract their disadvantaged situations by benefitting from the Jacobs idea of dense, lively, diverse, and accessible neighbourhoods. However, some authors have pointed out that, in current urban areas, vital neighbourhoods can be privileging accommodated social groups, while pushing the socioeconomic disadvantaged population aside (Connolly, 2018; Steil & Delgado, 2018; Stein, 2019). This would implicate that planning for vitality could, paradoxically, encourage dynamics of exclusion, such as neighbourhood gentrification, for example. Therefore, knowing who is truly taking advantage of vital spaces, is of fundamental relevance for the deployment of urban policies with a social equity approach. In this sense, several studies have identified the existence of intra-urban inequalities in the distribution of these urban features, affecting deprived communities differently (Bartzokas-Tsiompras et al., 2020; Lowe et al., 2020). To date, however, the discussion on how urban conditions for urban vitality are related with urban social inequalities is relatively new (Gunn et al., 2022). Most of the studies on urban vitality have been based on a quantification of urban vitality, using measures of the built environment, whereas, studies of its relationship with urban social dynamics are scarce, with some recent exceptions (Lan et al., 2020; Ma et al., 2022; Mouratidis & Poortinga, 2020). Thus, the main aim of this study is to address a key question: Does urban vitality spatially overlap with different levels of vulnerability?

One of the ways in which urban socioeconomic inequalities are expressed is through urban vulnerability (Antón-Alonso & Porcel, 2021), a concept that is gaining relevance within the research field of social disparities, poverty, and exclusion, particularly after the financial crisis of 2008 (Prada-Trigo, 2018) and the COVID-19 pandemic (Minguijon et al., 2022). Vulnerability, in a broad sense, refers to the inherent condition of the individual and collective existence, and highlights the exposition to the possibility of being damaged, together with a low capacity of defending against damaging impacts (United Nations, 2003, 2022). Under a social interpretation, Robert Castel (1991,1995) argued that everyone is situated in a double process of disengagement: in relation to work (stable job, precarious job, or absence of job), and in terms of relational or social inclusion (strong inclusion, fragile inclusion, or social isolation), being vulnerability and intermediate area between social exclusion and inclusion,

that combines employment precarity and fragility in relational supports (Castel, 1995). This idea of vulnerability as an anteroom of social exclusion is crucial for policymaking, as it recognises that there is potential opportunity to prevent it. In addition, vulnerability can refer, not only to the social environment of individuals, but also to their physical environment, meaning that living spaces can have certain conditions of risk and disadvantage that could enable or strengthen unfavourable situations (Alguacil Gómez et al., 2014). One of the strategies to reduce social vulnerability is by means of well-equipped urban environments, that allow people to satisfy everyday needs and build community ties (Klinenberg, 2018). The built environment can shape people's access to daily activities, thus, determining the ability of certain social groups to participate fully in the society, and affecting both the quality of life of individuals and the equity and cohesion of the society (Tiznado-Aitken et al., 2018; Tsou et al., 2005).

Therefore, it is important to identify in which urban contexts vulnerability and vitality are found, and to explore whether there does exist a link between them. With this goal, the aim of this paper is to explore the spatial relationship between urban vitality and urban vulnerability in the conurbation of Barcelona, Catalonia region, northeast Spain. With this study we aim to provide a deeper understanding of the spatial distribution of urban vitality in relation with social vulnerability, in order to inform urban practitioners, who work towards mitigating social inequalities, by means of designing and deploying spatial policies and interventions.

8.1.2. Methodology

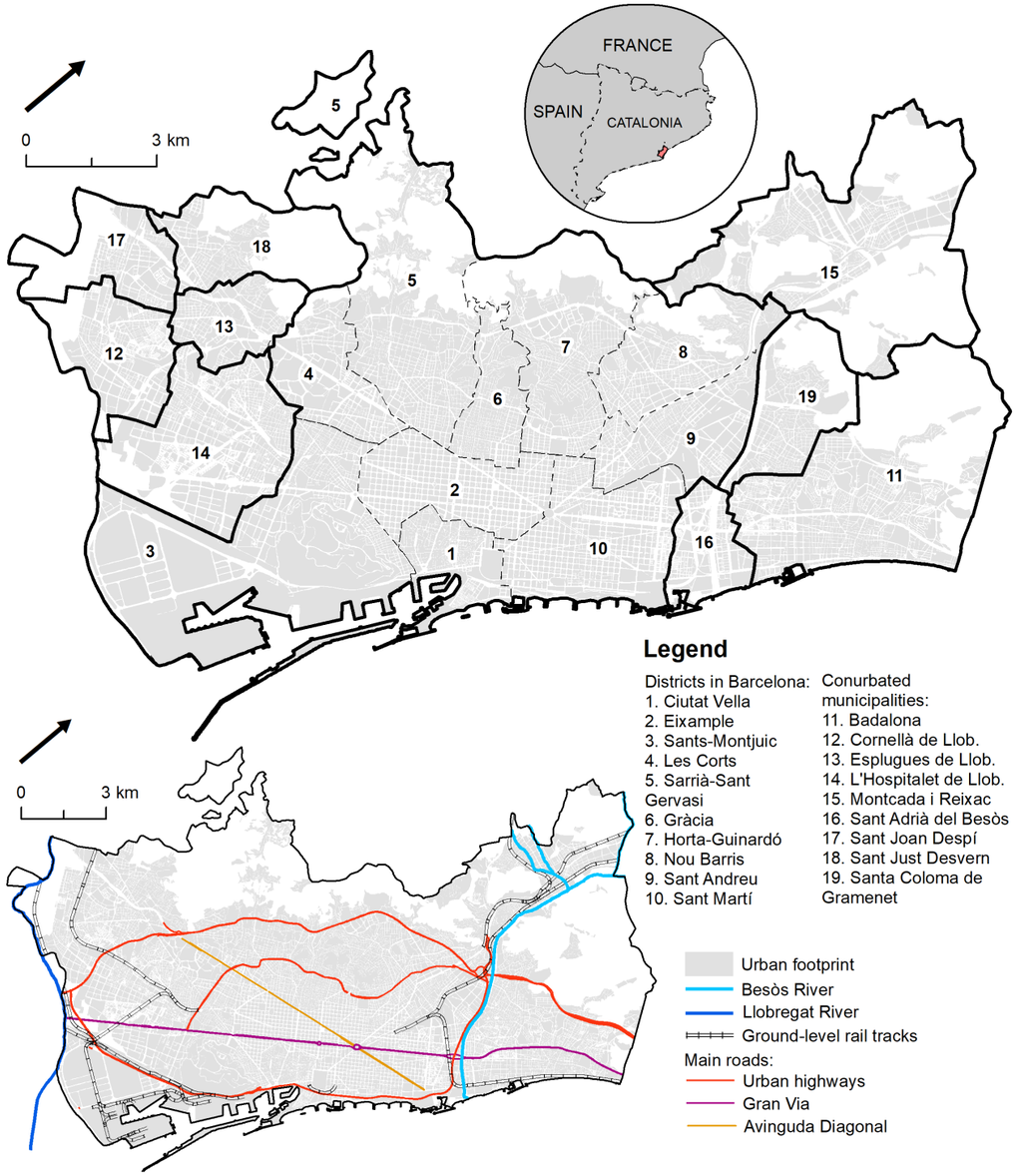
8.1.2.1. Study area

This study focuses on the conurbation of Barcelona (Figure 18), one of the largest metropolitan areas in Spain and in Southern Europe. Populated by approximately 2.5 million inhabitants and with an extension of 190 km2 (IDESCAT, 2021), the conurbation is composed by 10 municipalities, with the city of Barcelona at its centre (1.6 million inhabitants). This area is far from homogeneous, in terms of urban morphology and socioeconomic characteristics. Different historical milestones, economic developments, and urbanisation processes have led to a diversity of urban shapes, including historical towns, orthogonal expansions, high-rise and low-rise housing projects, or residential suburbanisation. Similarly, the metropolitan region is a socioeconomically heterogeneous mosaic that includes a population having diversity in socioeconomic status (SES). This area is covered by a public transportation system with a high frequency of service, composed of regional trains, subway and light rail systems, and interurban and urban bus services. As a reference for the analysis, we have divided up the area into 19 subareas of fairly comparable sizes, which correspond to the districts within the city of Barcelona, and the neighbouring municipalities.

8.1.2.2. Data

In order to analyse the conditions for urban vitality in the conurbation of Barcelona, we used the Jane index developed by Gómez-Varo et al. (2022). The Jane index is a synthetic indicator composed by 22 variables of the built environment, that measure the four main conditions for urban vitality that were theoretically described by Jane Jacobs (i.e. *Concentration*, *Contact Opportunity, Functional Diversity*, *Building Diversity*), as well as two accessory conditions (*Accessibility* and *Distance to Border Vacuums*) (Sung et al., 2015) within a 100 m x 100 m cell grid (Figure 19).

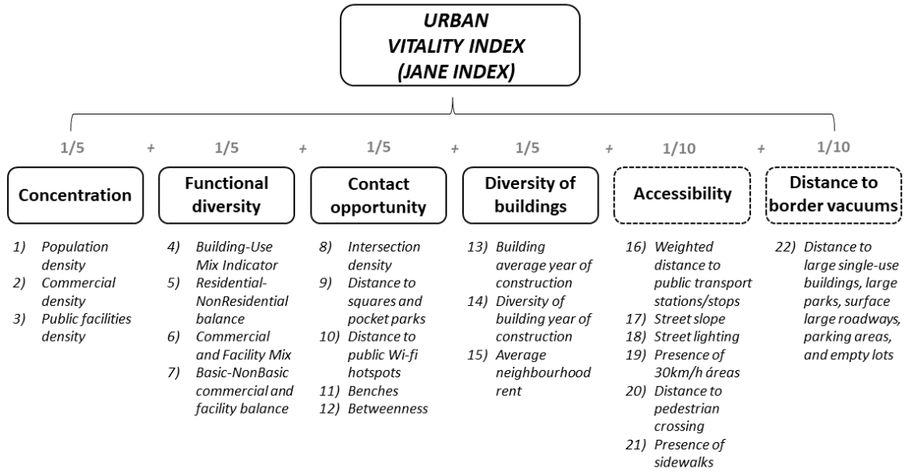
Figure 18. Study area: the conurbation of Barcelona.



Source: own elaboration.

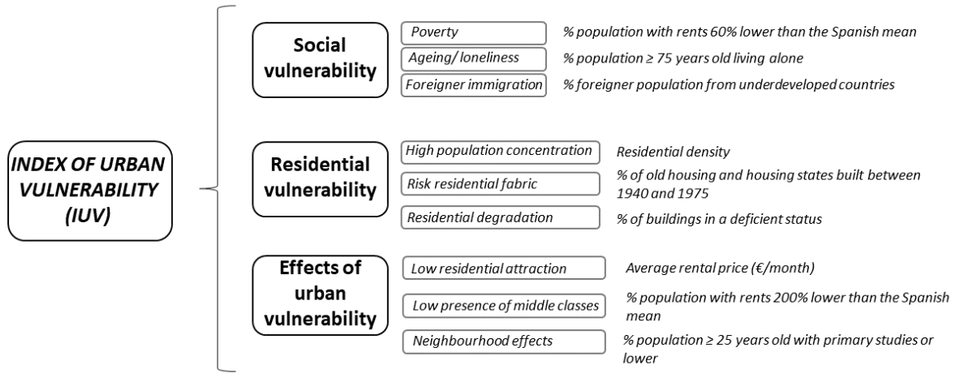
For urban vulnerability, we use the Index of Urban Vulnerability (IUV), developed by the Institute of Regional and Metropolitan Studies of Barcelona (Antón-Alonso & Porcel, 2021). The IUV is a synthetic indicator that, following the theoretical insights of Alguacil et al. (2014), measures urban vulnerability with consideration of social and residential exclusion factors, and the effects that derive from them (Figure 20). The data of this index come from diverse data sources, which mainly correspond to administrative records. The territorial units in which IUV is calculated are the Metropolitan Statistical Areas (MSA), which are similar to

Figure 19. Urban vitality Index (JANE Index) composition.



Source: own production based on Gómez-Varo et al., 2022.

Figure 20. Index of Urban Vulnerability (IUV) composition.



Source: own elaboration based on Antón-Alonso & Porcel (2021).

neighbourhoods and are currently considered as the sub-city territorial units of reference in the metropolitan area of Barcelona.

8.1.2.3. Analysis

Firstly, we conducted a descriptive analysis of the spatial distribution of both vitality and vulnerability in the study area. Then, we used spatial analysis techniques to examine how these two indicators interact in a space. The core of the analysis was based on Exploratory Spatial Data Analysis (ESDA) (Anselin, 1995). ESDA is a spatial analysis technique, that has been widely used in academic studies to help understand the geographical distribution of social issues with a clear spatial dimension, such as housing exclusion (A. Gutiérrez & Delclòs, 2016; Medina et al., 2020), the distribution of tourism accommodations (J. Gutiérrez et al., 2017; Lagonigro et al., 2020), the relationship between urban green and income (Gallego-Valadés et al., 2020), mobility indicators (De Silva et al., 2018; Lee et al., 2017), or health outcomes

(Scarpone et al., 2020), among others.

Considering that the two studied variables had different spatial units and IUV was originally calculated at the Metropolitan Statistical Area level, we downscaled this to be displayed in a 100 m x 100 m grid; hence, it is possible to relate it to the urban vitality index.

The ESDA was divided into two steps. To begin the analysis process, a univariate analysis of spatial autocorrelation was conducted for each of the variables: urban vitality (JANE index) and urban vulnerability (IUV). Firstly, we calculated the Global Moran Index (Moran, 1948) as an indicator of global spatial autocorrelation, that explains to what extent the analysed variables tend to display spatial grouping (positive spatial autocorrelation values, tending to 1), to present spatial dispersion (negative spatial autocorrelation values, tending to -1), or to

$$I = (N / S_0) \sum_{i=1}^{N} \sum_{j=1}^{N} W_{ij} (X_i - \mu)(X_j - \mu) / \sum_{i=1}^{N} (X_i - \mu)^2$$

be randomly distributed across space (autocorrelation values close to 0). The formula of the Global Moran Index is as follows:

$$(S_0 = \sum_{i=1}^{N} \sum_{j=1}^{n} Wij)$$

where N is the number of observations, i and j are the spatial units, μ is the mean of the variable X, Wij refers to the spatial weight of the adjacency matrix, and $S0$ is the sum of the whole spatial weight

However, Global Moran's Index provides a general indicator, without considering the specific spatial distribution of autocorrelation. In order to look at the possible heterogeneity of the spatial distribution of urban vitality and urban vulnerability, we calculated Local Indicator of Spatial Association (LISA) maps (Anselin, 1995). LISA maps allow to identify areas with concentrations of high and low values of vitality and vulnerability, atypical values in a space, and those areas with a non-statistically significant association. The formula of LISA is as follows:

$$I_i = \frac{(X_i - \mu)}{m_0} \sum_{j=1}^{N} (X_j - \mu)$$

Where $m_0 = \sum_{i=1}^{N} (x_i - \mu)^2 / n$.

The second step of the ESDA was to analyse the spatial relationship between urban vitality and vulnerability. To do so, we conducted a bivariate analysis of spatial correlation, operationalised as the bivariate version of both Global Moran's Index and LISA maps.

LISA maps, both in univariate and bivariate spatial autocorrelation, classify spatial units in four cluster groups. When there is a positive relationship, we find 1) *High-High* group, corresponding to cells with high values of one variable next to cells with high values of the same variable (in univariate analysis) or the second variable (in bivariate analysis), and 2) *Low-Low* group, corresponding to cells with low values of one variable next to cells with low values of the same variable (in univariate analysis) or the second variable (in bivariate analysis). In the case of negative relationships, we find 3) *High-Low* group, corresponding to cells with high values of one variable next to cells of low values of the same variable (in univariate analysis) or the second variable (in bivariate analysis), and 4) *Low-High* group, corresponding to cells with low values of one variable next to cells with high values of the same variable (in univariate analysis) or the second variable (in bivariate analysis).

In order to define the extent of spatial relationships we used the Queen contiguity criteria, where neighbours are all the elements with shared borders and vertices (Anselin, 2005). Geoda© software (version 1.20) was used for the ESDA analysis. GeoDa© provides a p-value that informs about the statistical significance of Moran's indicators, with a confidence level of 95% (p=0.05). Finally, maps were created in ESRI ArcMap©.

8.1.3. Results

8.1.3.1. The spatial distribution of urban vitality and vulnerability

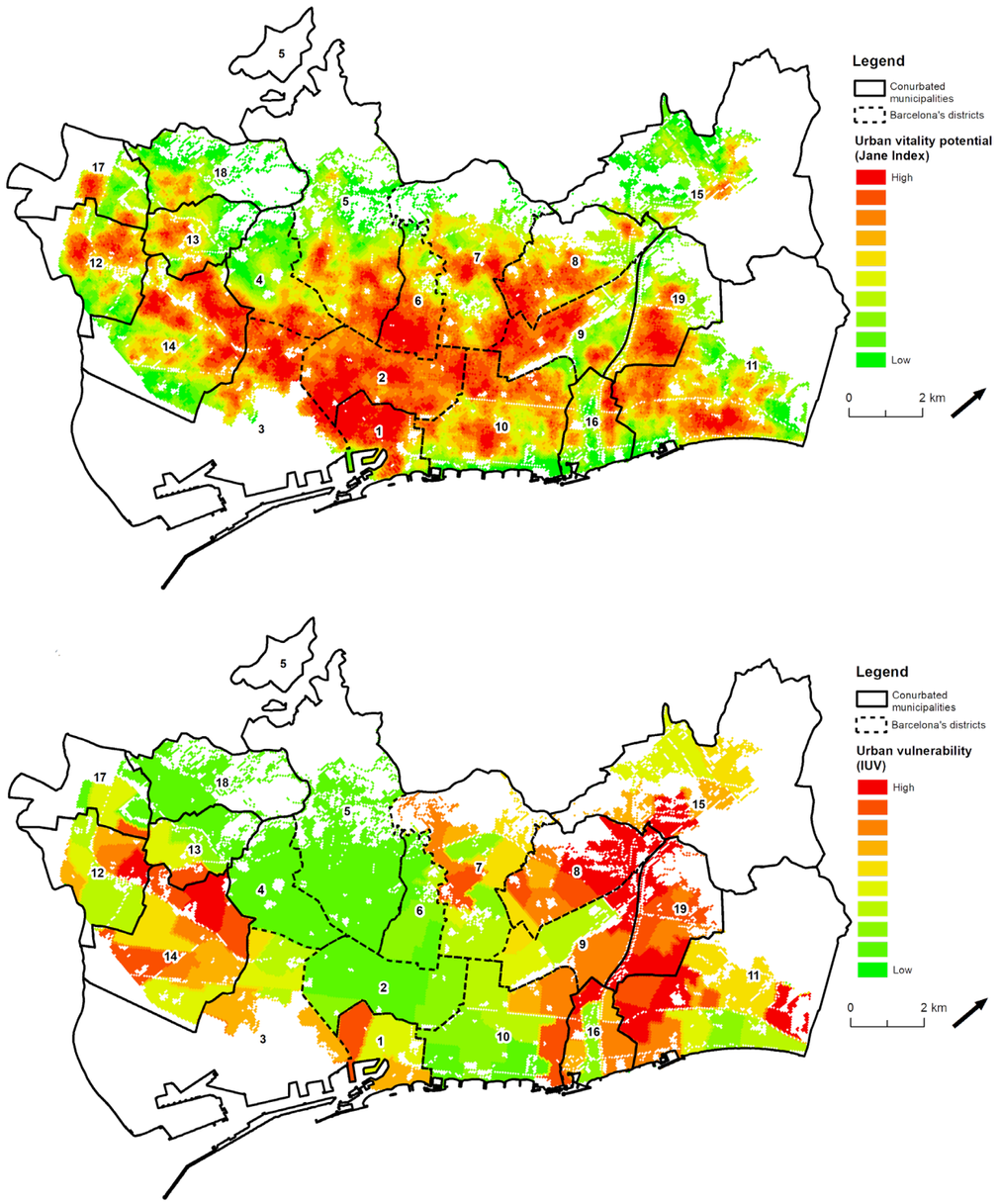
Urban vitality in the conurbation of Barcelona generally follows a polycentric distribution (Figure 21a). There is a main core in the central parts of the municipality of Barcelona, that extends to more peripheral parts of the city, and to the northern neighbourhoods of the contiguous municipality of *L'Hospitalet de Llobregat* (14). In addition, there are also other vital cores which are found in central areas of the rest of the municipalities in the conurbation, for example, in *Badalona* (11), *Cornellà de Llobregat* (12), *Esplugues de Llobregat* (13), *Montcada i Reixac* (15), or in *Sant Adrià del Besòs* (16). Otherwise, non-vital areas are mainly found in the outskirts of the urban area, for example, in the northern part of the conurbation, next to large roads and natural limits, such as the Collserola mountain, the vicinities of Besòs and Llobregat rivers, and on the seafront, with the exception of the city of *Badalona* and a portion of *Ciutat Vella* district in Barcelona.

By contrast, urban vulnerability presents a more marked linear pattern, with two main corridors of high levels of urban vulnerability in peripheral areas. These are situated in contiguous municipalities (*L'Hospitalet de Llobregat* (14), *Cornellà de Llobregat* (12), *Santa Coloma de Gramenet* (19), Sant Adrià de Besòs (16), *Badalona* (11) and *Montcada i Reixac* (15)), with some exceptions within the city of Barcelona (in the historical district of *Ciutat Vella*) and in the outskirts northern-western districts (*Horta-Guinardó* (7), *Nou Barris* (8), *Sant Andreu* (9)) (Figure 21b). Differently, lower levels of urban vulnerability are found in central areas of the city of Barcelona, following the trace of one of its main avenues, the Avinguda Diagonal, until the northern-westerns districts (such as *Sarrià-Sant Gervasi* (5), *Les Corts* (4), *Sant Joan Despí* (17), and northern neighbourhoods of *Esplugues de Llobregat* (13).

The distribution of urban vitality in the conurbation of Barcelona presents a strong positive tendency towards spatial grouping, as shown by the Global Moran's Index results (Moran's I = 0,985) (Table 4). More vital areas tend to be located near other areas with similar characteristics. Equally, areas with the low values of vitality are also found in close proximity to each other. In a similar way, urban vulnerability also presents a positive tendency to concentrate in a space (Moran's I = 0,971).

However, these relationships are not equally distributed in a space, as shown in LISA maps. Figure 22 shows the distribution of the four types of spatial clusters of both vitality and vulnerability. Urban vitality and vulnerability present different spatial autocorrelation patterns within the study area. On the one hand, vitality (High-High values) is mainly concentrated in

Figure 21. Urban vitality (JANE index) (a) and urban vulnerability (IUV Index) (b) in the conurbation of Barcelona.



Source: own elaboration. 1. Ciutat Vella, 2. Eixample, 3. Sants-Montjuïc, 4. Les Corts, 5. Sarrià-Sant Gervasi, 6. Gràcia, 7. Horta-Guinardó, 8. Nou Barris, 9. Sant Andreu, 10. Sant Martí, 11. Badalona, 12. Cornellà de Llobregat, 13. Sant Feliu de Llobregat, 14. L'Hospitalet de Llobregat, 15. Montcada i Reixac, 16. Sant Adrià del Besòs, 17. Sant Joan Despí, 18. Sant Just Desvern, 19. Santa Coloma de Gramenet.

Table 4. Spatial autocorrelation of urban vitality and urban vulnerability, univariate and bivariate Global Moran's Index.

Urban vitality (JANE index)	0,985*
Urban vulnerability (IUV)	0,971*
Urban vitality – Urban vulnerability (Bivariate)	-0,00

*Statistically significant (p<0.01). Source: Own production.

compact, high-density areas, that are mostly located in the central city and some peripheral enclaves, whereas absence of vitality (Low-Low values) is relegated to the city administrative limits, those both bordering with the mountains (in the northwest) and industrial areas (on both sides of the city).

On the other hand, two corridors of urban vulnerability (High-High values) are clearly distinguished in peripheral neighbourhoods of the conurbation. A first enclave is on the southwestern side of the conurbation, mainly in the adjacent municipalities of *L'Hospitalet de Llobregat* (14), extending to most of the neighbouring city of *Cornellà de LLobregat* (12). A second enclave is found along the neighbouring areas of Besòs river, comprising the districts of *Nou Barris* (8) and *Sant Andreu* (9) of the city of Barcelona, and other adjacent municipalities, such as *Sant Adrià del Besòs* (16), *Badalona* (11), *Santa Coloma de Gramenet* (19), and *Montcada i Reixac* (15). Besides these two corridors, two isolated spots of urban vulnerability are found inside the city of Barcelona: one in the historical neighbourhoods of *Ciutat Vella* district (1), and another in *Horta-Guinardó* district (7). By contrast, clusters of low vulnerability (Low-Low values) are found both in central and more peripheral areas of the conurbation. Particularly, a linear pattern is identified, that follows the pattern of the Avinguda Diagonal, one of the main arteries of the city, forming a cone of low vulnerability that goes from the central neighbourhoods and extends to the northern-western periphery.

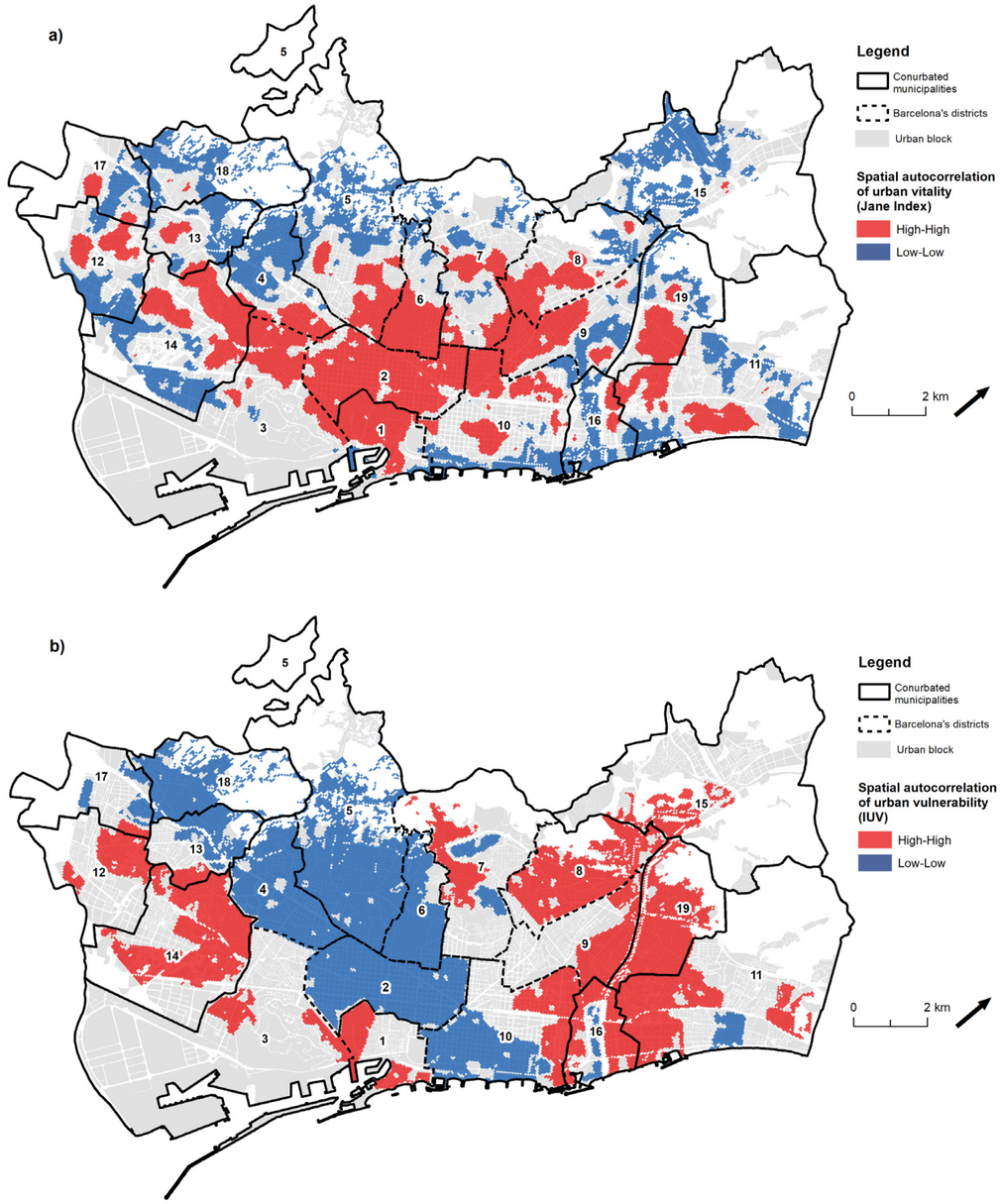
8.1.3.2. The relationship between urban vitality and vulnerability

Globally, there is no statistically significant spatial relationship between vitality and urban vulnerability (Bivariate Global Moran's I = - 0,004). However, the local version of Moran's indicator operationalised through LISA maps, shows a different picture (Figure 23), resulting in four scenarios that are heterogeneously distributed across the studied area.

Firstly, covering a 19% of the analysed territory, we found High-High clusters (high values of urban vitality overlapping high values of urban vulnerability) in two main enclaves, located in adjacent municipalities on both sides of the city of Barcelona. One is situated on the eastern side of Besòs River, in the southern neighbourhoods of *Santa Coloma de Gramenet* (19), neighbourhoods of *Sant Adrià del Besòs* (16), and *Badalona* (11). The other starts in the northern neighbourhoods of *L'Hospitalet de Llobregat* (14), extending to other neighbours of the city and to *Cornellà de Llobregat* (12). We also found isolated High-High clusters within the city of Barcelona, mostly in their north-eastern and eastern bordering neighbourhoods of *Nou Barris* (8), *Sant Andreu* (9) and *Sant Martí* (10) in the hilly part of *Sants-Montjuïc* district close to an industrial area, and in specific neighbourhoods of the historical district of *Ciutat Vella* (1).

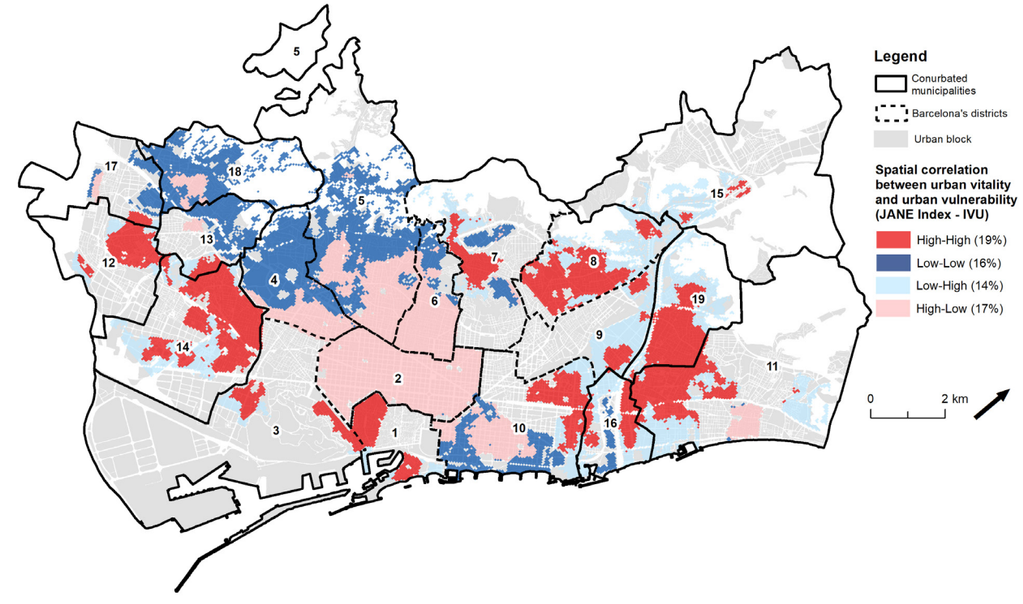
By contrast, Low-Low clusters are those areas that present low values both of vitality and

Figure 22. Univariate spatial autocorrelation of Urban vitality (JANE index) (a) and urban vulnerability (IUV Index) (b) in the conurbation of Barcelona.



Source: own elaboration. 1. Ciutat Vella, 2. Eixample, 3. Sants-Montjuïc, 4. Les Corts, 5. Sarrià-Sant Gervasi, 6. Gràcia, 7. Horta-Guinardó, 8. Nou Barris, 9. Sant Andreu, 10. Sant Martí, 11. Badalona, 12. Cornellà de Llobregat, 13. Sant Feliu de Llobregat, 14. L'Hospitalet de Llobregat, 15. Montcada i Reixac, 16. Sant Adrià del Besòs, 17. Sant Joan Despí, 18. Sant Just Desvern, 19. Santa Coloma de Gramenet.

Figure 23. Bivariate spatial correlation of Urban vitality (JANE index) and urban vulnerability (IUV Index) in the conurbation of Barcelona.



Source: own elaboration. 1. Ciutat Vella, 2. Eixample, 3. Sants-Montjuïc, 4. Les Corts, 5. Sarrià-Sant Gervasi, 6. Gràcia, 7. Horta-Guinardó, 8. Nou Barris, 9. Sant Andreu, 10. Sant Martí, 11. Badalona, 12. Cornellà de Llobregat, 13. Sant Feliu de Llobregat, 14. L'Hospitalet de Llobregat, 15. Montcada i Reixac, 16. Sant Adrià del Besòs, 17. Sant Joan Despí, 18. Sant Just Desvern, 19. Santa Coloma de Gramenet.

vulnerability, and represent 16% of the studied area. They are mainly concentrated in the north-western cone of the conurbation of Barcelona, comprising northern neighbourhoods of Barcelona, and northern areas above the northern ring road (Ronda de Dalt), in neighbourhoods of Esplugues (13), *Sant Just Desvern* (18), and *Sant Joan Despí* (17) municipalities. All of these areas are characterised by a concentrated wealthy population, and having urban forms with low density population and urban sprawl. We also found isolated spots of Low-Low clusters along the seafront of Barcelona, around the historical neighbourhood of *Sant Martí* (10) district.

A third group is formed by Low-High clusters which cover 14% of the conurbation, that are formed by areas with low values of vitality and high values of vulnerability, which are mainly situated on peripheral sides of the city. This is particularly true of the northern part of the eastern side of the city, close to Besòs river, and an isolated concentration in one neighbourhood of *L'Hospitalet de Llobregat* (14). This group is characterised by its proximity to multiple border vacuums, such as unmettaled roads and railway tracks, large infrastructures, or they have industrial areas within their proximities.

Finally, we find High-Low clusters, a group which corresponds to 17% of the conurbation, with high values of vitality and low values of vulnerability. These areas are located mainly in the city centre of Barcelona, drawing a pattern along Avinguda Diagonal, comprising neighbourhoods of the orthogonal urban expansion and historical towns of the north of Barcelona (in *Gràcia* (6) and *Sarrià-Sant Gervasi* (5) districts), bounded by the limit of one of the city's internal road rings, and in the seafront (Poblenou neighbourhood in *Sant Martí* (10) district). We also

find a cluster of High-Low values in more distant municipalities, mainly in the historical cores, such as the northern peripheral municipalities of *Sant Just Desvern* (18) and *Esplugues de Llobregat* (13), close to the Collserola mountain, and along the seafront, with the historical town of *Badalona*.

8.1.4. Discussion

The main goal of our research was to examine the spatial relationship between urban vitality and urban vulnerability, using Barcelona as a case study. We found that urban vitality and urban vulnerability, at first, showed apparently unrelated spatial distributions. However, by means of ESDA techniques, we were able to detect and quantify statistically significant spatial associations between vitality and vulnerability in specific parts of the conurbation. The results of such associations were used in the identification of four different scenarios, which not only warrant specific interpretations, but at the same time have different implications that can help outline scenario-specific policy strategies.

Urban vitality in Barcelona follows a polycentric pattern with diverse sub-centres of potential vitality spread throughout the territory, as previous studies have shown (Delclòs-Alió & Miralles-Guasch, 2018b; Masip-Tresserra, 2016). These vital cores correspond to different urban types, particularly to historical towns with a compact urban form that have traditionally boosted proximity dynamics, together with orthogonal urban expansions that merged these diverse historical cores, and lately, high-rise housing estates that were mostly built in the second half of the 20th century to host a migrated workforce that established itself in the Barcelona area. They all have, as a common thread, a combination of urban density, mixed-use, and high levels of accessibility. By contrast, areas with low potential for vitality correspond to those situated in the limits of the city, close to ground-level large infrastructures (i.e. roads, rails, single-use large facilities), and to those sprawled residential developments presenting low levels of density. Moreover, the main contribution of the present study is that we evidence local associations between urban vitality and urban vulnerability which, in turn, helps in identifying four different scenarios for policy intervention.

The first scenario that we identified are High vitality – High vulnerability areas, covering 19% of the studied territory. Mostly located in the outskirts of the Barcelona city and in conurbated municipalities, they present diverse urban shapes such as historic towns, compact urban forms, and high-rise housing projects. Most of these high-density neighbourhoods experimented a high-speed growth during the 1950 to 1970s, as they welcomed a working class population that was migrating to Barcelona (Domingo i Clota & Bonet i Casas, 1998). Originally built-up, and with many deficiencies, in some of these neighbourhoods, major urban renewal projects were implemented by the regional authorities during the first decade of the 2000s, that provided a general improvement in physical infrastructure, facilities, and accessibility (Mehdipanah et al., 2013). We also found a High-High scenario in the central core of Barcelona, in one of the neighbourhoods of *Ciutat Vella* district (1), an ancient neighbourhood of the medieval city of Barcelona, that since more than two decades ago has welcomed migrants coming from low and middle income countries. These High-High areas are the tangible evidence that a socioeconomically disadvantaged population can also enjoy vibrant environments with high levels of accessibility. These are the result of dense urban shapes, together with the effort of public policies, that provided well-equipped neighbourhoods. Therefore, in these contexts, urban vitality contributes to an improvement of the quality of life for the most vulnerable populations. However, there is a sustained latent risk of elitisation, precisely because of the intrinsic condition of vulnerability that characterises these areas. According to previous

evidence, one of the common reported problematic is the displacement of low-income residents and gentrification processes, which in global cities such as Barcelona are the result of a combination of both local and international dynamics (Cocola-Gant & Lopez-Gay, 2020). More particularly, in Barcelona's context this displacement trend started in central-city areas and has also currently arrived to more peripheral neighbourhoods (Antunes et al., 2020). Therefore, rather than focusing on physical and infrastructure improvements in these High-High scenarios, policymakers would do better by focussing on urban policies that guarantee the liveability for the most vulnerable neighbourhoods. This could be achieved by, for example, implementing housing policies that promote the permanence of neighbours via, for instance, incrementing the minimum time extension of rental contracts (Nasarre-Aznar & Molina-Roig, 2017), or the creation of a competitive public housing rental market (Donat, 2017).

Secondly, Low vitality – Low vulnerability areas are found, representing 16% of the conurbation. This reality demonstrates that socially privileged areas do not necessarily correspond to the most vital urban spaces. In fact, it is quite the reverse and, precisely, certain areas where high-income groups live hold very low levels of street-life and diversity. They correspond to low-density residential neighbourhoods in the city outskirts, that lack daily life facilities, and have a low level of public transport accessibility. Low-Low areas in adjacent cities correspond to urban settlements, that have grown during the urban sprawl of the Barcelona Metropolitan Area (AMB) in the 1990-2000 period, which supposed a process of urban simplification, landscape homogenisation, and loss of urban diversity and complexity that had traditionally characterised the Mediterranean city (Munoz, 2003). However, we also find Low-Low concentrations inside Barcelona city, in certain seafront areas that have been affected by relatively recent urban renewal projects. Particularly, in Vila Olímpica, the residential area created for the Barcelona 1992 Olympic Games (Barcelona '92), and afterwards the Forum area that was created for the Universal Forum of Cultures Barcelona 2004 (a 141-day international cultural event) (Majoor, 2011). These findings support previous observations on how mega-event planning, by means of large-scale projects, have negative long-term impacts on both the built environment and the population (Müller, 2015), as evidenced here, in terms of the lack of street vitality, and the elitisation of certain city spaces. People living in these areas, particularly those in residential developments on the city outskirts, are usually the wealthier population, who are self-selecting to live in low density and/or low diversity environments. This residential choice is driven by life attitudes, as evidenced by previous research, and often results in high car use and motorised lifestyles that have negative environmental and social costs (Scheiner & Holz-Rau, 2013). Therefore, urban policies on Low-Low neighbourhoods should be aimed at preventing their externalities, by promoting more dense and mixed developments, in terms of the diversity of uses and population (i.e. by means of housing or commercial policies), transport policies that favour space-efficient modes (active mobility and public transit) allowing car-free spaces, while also avoiding zoning and other urban policies that would encourage urban sprawl (Litman, 2015).

Thirdly, High vitality – Low vulnerability areas are found, with high vitality and low vulnerability levels, and representing 17% of the conurbation, particularly, in neighbourhoods that used to be historical towns, and also in the orthogonal urban expansion, the *Eixample* (2) district, which at the beginning of the 20th century integrated many of these historical cores to form the city of Barcelona. These neighbourhoods present dense and compact urban forms with blocks and facilities at the ground floor level, and a high degree of accessibility to the city centre via public transport. The High-Low scenarios represent what some of the critical voices of Jacobs, in arguing that her idea on urban vitality, ultimately, was defending a middle-class way of life for relatively privileged neighbourhoods (Kirby, 2018; Stein, 2019). One plausible

explanation of these High-Low areas could be their successful management, in terms of generators of quality of life. More recent voices, however, acknowledge that in the past few years, some of these areas have become physical and symbolic 'new touristic centres' of attraction, as they are seen as 'modern, alternative, and cool neighbourhoods', perceived as 'safe urban spaces with a creative and middle-class atmosphere', which have resulted in their being impacted by gentrification processes and, consequently, they have lost the traditional commerce (Lagonigro et al., 2020; Mansilla & Milano, 2019). Therefore, urban policies in High-Low scenarios now face the challenge of democratising vital spaces for a wider range of SES population. As physical infrastructure is well-equipped, efforts should be made in the social dimension, primarily, by promoting diversity of residents. Different urban policies can be implemented in this commitment, including spatially targeted affordable housing policies, that guarantee the presence of low-rent population via such factors as social housing (Dawkins & Moeckel, 2016), regulations of the sharing of economic activities that have an impact on the everyday life of neighbourhoods (i.e. limiting the presence of short-term housing platforms) (Ferreri & Sanyal, 2018). Similarly, top-down urban policies that are willing to attract 'creative classes' into particular neighbourhoods, should be avoided in order to prevent their elitisation.

Finally, Low vitality – High vulnerability areas, representing 14% of the analysed territory, are mainly found in peripheral areas of conurbated municipalities. They correspond to areas that are located close to border vacuums, which present different types of monofunctional developments, such as industrial estates, informal residential settlements of self-constructed housing, or isolated residential high-rise housing projects. These areas have traditionally been neglected by urban policies partly because, paradoxically, in more disadvantaged neighbourhoods, the ability of local expenditure of their municipal administrations is smaller than in wealthier neighbourhoods (Nel·lo & AguadoMoralejo, 2021). Therefore, Low-High neighbourhoods probably are the scenarios that need to be given more priority attention by urban policies, which would need to address both physical (by creating mixed-used environments, or improving pedestrian and public transport accessibility) and social dimensions. For this commitment, some authors state the need to implement policies in a supra-municipal level that overcome the administrative limitations of more disadvantaged municipalities (Donat Muñoz, 2021). As an example, some cities are advocating to create mobility hubs at a metropolitan scale in areas where there is a general lack of infrastructure (Maciel Costa da Silva, 2021).

Despite the insights that are described in the previous paragraphs, our study has some limitations, that need to be taken into consideration in order to properly interpret the results, as well as to inform future studies. A first limitation relates to the use of synthetic indexes for measuring two theoretical and widely discussed concepts, such as urban vitality and urban vulnerability. Although the construction of such indexes was based on an exhaustive review of the literature, other authors could argue the use of different indicators and weights for its calculation, particularly if it is intended to apply them in other urban contexts. A second limitation is related with the spatial unit that is used for the ESDA technique. As exhaustively highlighted by previous research, the so-called "modifiable areal unit problem (MAUP)" appears when data are aggregated in a determinate spatial unit (Jelinski & Wu, 1996a). It was intended to minimise this problem, using a highly disaggregated spatial unit, the 100 m x 100 m grid in the Jane Index, however, the Urban Vulnerability Index is collected using a major spatial scale. Finally, a third limitation is in the interpretation of the results. Although the ESDA allows to know where and how urban vitality and vulnerability are related, it is not possible to acknowledge the causality of these spatial relationships. Our results are focused on

associations and, as such, the results provide solely a static image of the two phenomena which, indeed, are measured in different time period moments. In this sense, a natural progression of this work would be to explore the associations that are found in our study, but using a longitudinal design. Furthermore, this was a purely quantitative examination of how urban vitality and vulnerability interact in space, but more in-depth knowledge could be gained by using a qualitative exploration of how residents perceive, and live in, different contexts.

8.1.5. Conclusion

In this study we aimed to provide quantifiable evidence to one of the critical issues in the current agenda for both urban research and practice, which is to understand to what extent urban environments that are accessible, comfortable, and attractive (i.e. vital environments) can be exclusively offered to those who are socially privileged. To do this, we used the theoretical framework of Jane Jacobs and her notion of urban vitality, which we explored against different levels of urban social vulnerability. We showed how in a dense, diverse, and generally lively Mediterranean city such as Barcelona, the most vital environments are, indeed, home to a population that is generally not socially vulnerable, as expected. However, we also identified different scenarios that add more room for interpretation and further study, which may be of particular interest to policymakers, not only in Barcelona, but also in global cities that share similar built environment traits, and that are working towards more liveable cities, while combating urban poverty, social exclusion, and intra-urban inequalities.

Taken together, the four presented scenarios strengthen the idea of Gómez-Varo et al. (2022) that urban vitality, rather than being a unique characteristic of certain types of neighbourhoods, can be found in widely different urban contexts presenting a diversity of built environments and sociodemographic circumstances. Hence, the evidence described in this paper has significant implications for the understanding of the principles of urban vitality as laid out by Jacobs, with a social perspective, as most of the research in this field has merely focused on the study of the built environment.

This research has also important implications for future practice. The proposed exploratory spatial analysis with the two synthetic indexes establishes a framework tool to detect different scenarios of intervention, contributing to a more accurate diagnosis for the design of tailor-made policies. In this sense, the replicability of the used methodology, as another key contribution of the paper, could serve as a basis to study urban vitality and its socioeconomic correlates in other urban contexts around the world.

To conclude, this study has shown two main challenges facing future research that would analyse the relationship between urban vitality and vulnerability. Firstly, as long as longitudinal data at an infra-municipal level are available, it will be crucial to follow up the possible changes of a population's SES and built environment conditions. Secondly, evidence from this paper should also stimulate qualitative research to understand the everyday life of the different urban context. Only by addressing both challenges will we better informed to elaborate effective policies for the promotion of liveable and fair neighbourhoods.

8.2. Spatial distribution of retail diversity in relation to social vulnerability and touristic pressure. The case of Barcelona.

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Unravelling retail diversity through its spatial relationship with social vulnerability and tourism pressures in Barcelona

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ABSTRACT
Diversity in retail and facilities is essential for creating proximity environments. Most analyses have focused on either built environment predictors or the balance between diversity and social vulnerability and tourism, but little is known of their interrelationship. Using georeferenced data of retail and facilities in Barcelona (Spain), the study shows that diversity is positively associated with compact and dense environments, but negatively related to social vulnerability and tourist accommodation. Five clusters were studied based on retail diversity, urban vulnerability, and tourist intensity. Some areas may be endangered by the overrepresentation of specific activities. These insights can inform activity diversification policies.

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8.2.1. Introduction

Creating vital and liveable cities has become a priority in the urban agenda. In particular, the concept of urban diversity has been labelled by some authors as a crucial feature for the sustainability and resilience of cities. Thriving urban spaces require a certain diversity of retail and facilities in a proximate environment to ensure access to a wide range of daily activities by means of active modes of transportation. The availability of a diverse environment of retail and facilities close to home allows for shorter trips, and enables walking and biking for utilitarian transportation, thereby reducing car dependency. At the social level, urban environments that host a diversity of retail and facilities (i.e. health centers, sport centers, cultural centers, schools, etc.) also contribute to the creation of more democratic and equitable cities (Connolly 2018), as the location of a diversity of functions throughout the city ensures equitable access to a range of activities for all individuals (Miralles-Guasch & Marquet, 2013).

In recent years, a number of initiatives have sought to promote diversity of retail and facility infrastructure, under different branding; the "X-minute city" in cities like Paris, Barcelona, Portland, or Melbourne (Moreno et al., 2021; Victoria State Government, 2020), the "Close-knit city" in Gothenburg (City of Gothenburg, 2014), the so-called "care blocks" in Bogotá (Gobierno de Bogotá, 2021) and "superblocks" in Barcelona (Àrea Ecologia Urbana & Barcelona Regional, 2023). All these initiatives share the common goal of improving daily lives of individuals, by improving access to daily activities within a proximity radius, thereby increasing convenience and saving time.

The interest in the diversity of retail and facility activities has been also reflected in the academic literature, considering that a significant body of research exists on the subject. Traditionally, the diversity has been studied using land-use-based indicators at the city, district, or neighborhood levels (Dovey and Pafka, 2017). While these contributions are valuable to understand city-level patterns, they are limited in their ability to clearly depict how diversity refers to these patterns, and what type of specific activities they are composed of. In fact, according to the principles of Jane Jacobs, the proper scale with which to understand diversity is at the neighborhood and street levels (Perrone, 2019). In this sense, in recent years several studies have aimed to understand how this diversity operates at a more detailed scale, which at the same time has been supported by the increase in the availability of georeferenced data (Q. He et al., 2018; Kang 2020; Wang and Niu, 2019).

One of the ways in which diversity has been studied at the street-level scale is through the use of georeferenced point data on urban retail and day-to-day facilities and services (Yoshimura, Kumakoshi et al., 2021). Such an approach has been employed in a considerable number of previous studies, which have focused on investigating the factors associated with diversity of activities, by examining their relationship with certain built environment characteristics (Cui et al., 2016). Overall, it is often observed that higher levels of retail and facility diversity are correlated with higher population density, closer proximity to public transportation, central areas, and larger cities, although variations in these relationships may be observed depending on the specific urban context (Kumakoshi et al, 2021; Yoshimura, Santi et al., 2021).

Other researchers have explored the ways in which retail and facility diversity are associated with specific socioeconomic characteristics and social phenomena (Anguelovski, 2015; Fernández-Escobar, et al. 2022, 2022; S. He, 2015; Reese, 2019), with particular emphasis on the impact of socioeconomic vulnerabilities of neighborhoods, and the presence of tourism as one of the most affecting factors. The common goal here has been understanding whether retail diversity is affected by underlying dynamics of gentrification/vulnerability, or whether the touristification of areas has a detrimental effect on the diversity of available retail. Regarding the socioeconomic dimension, for instance, some studies indicate that area median income (AMI) levels are a key factor in accessing a healthy food supply (Bridle-Fitzpatrick, 2015; Londoño-Cañola et al., 2023).With regards to tourism, it is acknowledged that it influences local retail dynamics and the location of activities in many cities, as previous studies have demonstrated a transformation of commercial structures to satisfy the needs of tourists (Ananian et al., 2018; Blázquez-Salom et al., 2019).

Despite the relevance of these contributions, two issues that require additional investigation are identified. One such gap in the literature corresponds to the lack of attention paid to the combined effects of both the built environment and socioeconomic factors on retail and facility diversity levels. While some studies have examined these dimensions separately, the relationship between these two combined dimensions and their influence on different levels of diversity remains largely understudied. A second gap in the literature refers to the relationship between socioeconomic vulnerability and tourism with the spatial distribution of retail and facility activities. Previous studies have focused primarily on specific retail categories or facilities, mostly regarding food retail (Garcia et al., 2020; Gómez-Varo et al., 2021; Goossensen et al., 2023) and leisure activities (Cui et al., 2016), while there is limited evidence on the broader landscape of retail and facility activities in urban areas.

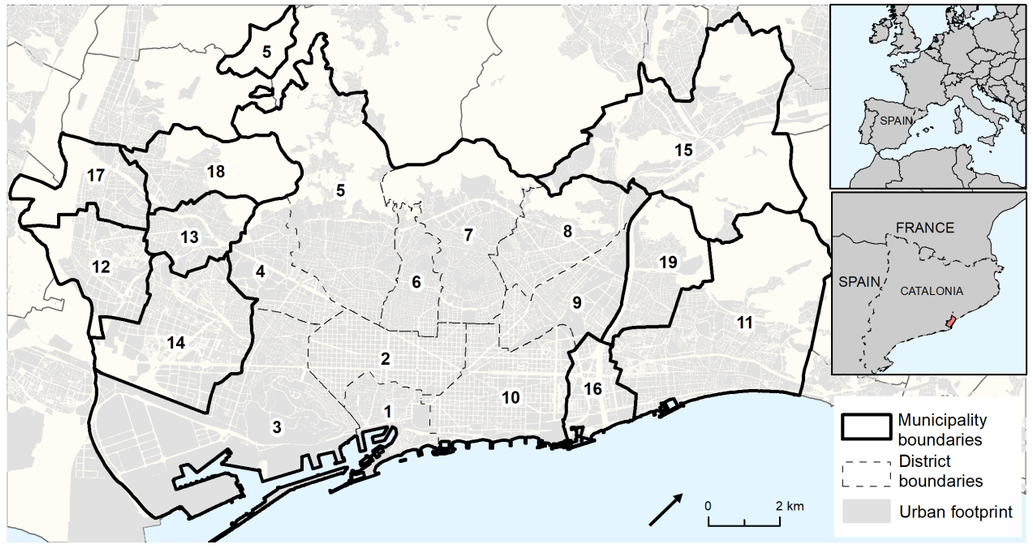
Addressing these gaps in the literature is crucial for developing a more nuanced understanding of the factors that drive diversity of retail and facilities in urban areas, and informing policies that promote inclusive and equitable urban environments. As the significance of diverse retail and facility environments for urban well-being and social sustainability becomes more evident, it becomes increasingly important to understand how these diversity dynamics interact with other underlying dynamics in the city. Therefore, this paper aims to investigate two main research questions: 1) What built environment characteristics and social factors are related with higher diversity of retail activities and facilities? 2) Which types of specific retail and facilities are found in contexts with different diversity levels, socioeconomic vulnerability, and tourism presence levels.

8.2.2. Methods

8.2.2.1. Study area

This study is set in the urban area of the City of Barcelona (situated in the province of Barcelona, Catalonia region, NE Spain). As study area the city conurbation is selected, defined as the municipalities that share an urban continuum, which includes the Municipality of Barcelona as well nine surrounding municipalities (Figure 24). With an area of 190 km2 and a population of approximately 2.5 million (1.6 million of whom reside in the City of Barcelona), the conurbation of Barcelona is one of the largest metropolitan areas in Southern Europe. Barcelona presents an interesting urban context, with which to explore the topic of diversity due to its compact and dense urban form, as well as a widely extended and decentralised commercial retail and infrastructure network. Additionally, the City of Barcelona serves as a global reference for issues related to tourism, which have been argued to impact the city's uses, infrastructure, and commercial networks (Frago, 2021). The concentration of particular activities in specific areas, leading to a decrease in diversity, has been a topic of ongoing debate in the city in recent years, and continues to be relevant today (Betevé, 2023). In this regard, the Barcelona City

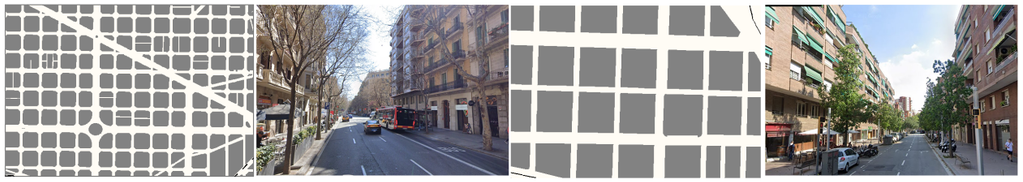
Figure 24. Study area: the conurbation of Barcelona and its different urban shapes.



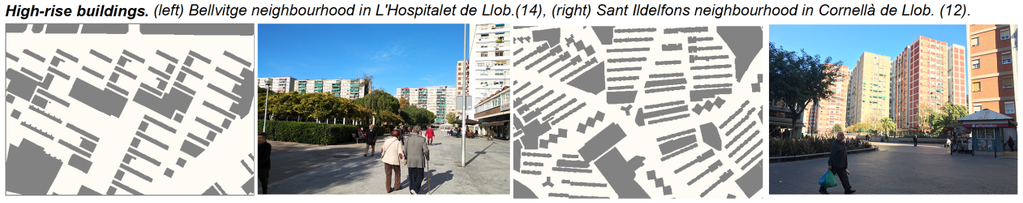
Districts in Barcelona: 1. Ciutat Vella; 2. Eixample; 3. Sants-Montjuic; 4. Les Corts; 5. Sarrià-Sant Gervasi; 6. Gràcia; 7. Horta-Guinardó; 8. Nou Barris; 9. Sant Andreu; 10. Sant Martí **Conurbated municipalities:** 11. Badalona; 12. Cornellà de Llobregat; 13. Esplugues de Llobregat; 14. L'Hospitalet de Llobregat; 15. Montcada i Reixac; 16. Sant Adrià del Besòs; 17. Sant Joan Despí; 18. Sant Just Desvern; 19. Santa Coloma de Gramenet.

Historic urban cores. *(left) Ciutat Vella district (1), (right) historical town of Badalona (11).*

Orthogonal urban expansions. *(left) Eixample district (2), (right) Vilapicina i la Torre Llobeta neighbourhood in Nou Barris district (8).*



High-rise buildings. *(left) Bellvitge neighbourhood in L'Hospitalet de Llob.(14), (right) Sant Ildelfons neighbourhood in Cornellà de Llob. (12).*



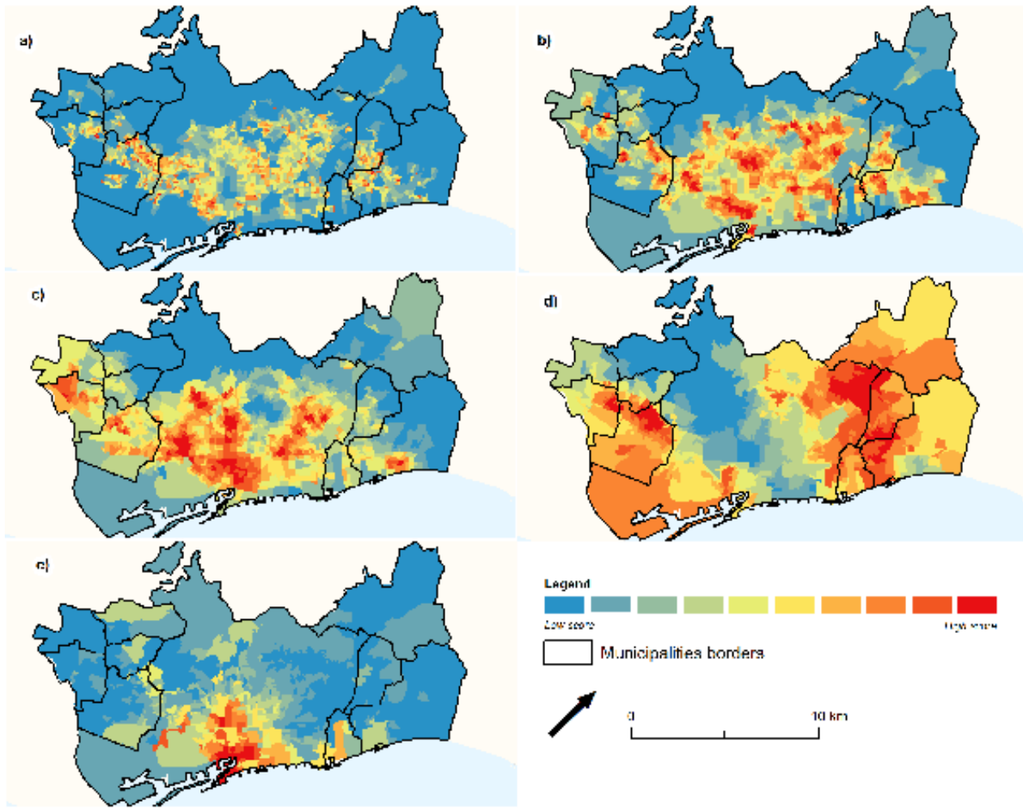
Residential urban sprawl. *(left) Mas Lluí neighbourhood in Sant Felilu de Llob. (13), (right) Torre Baró neighbourhood in Nou Barris district (8).*

Source: own elaboration.

Council has enacted policies to regulate tourist activity, including the implementation of the Special Urban Plan for Tourist Accommodation (PEUAT), that limits new hotel licenses within the city center and prohibits new licenses for tourist apartments, with the primary objectives of prioritizing the right to housing for local residents, and maintaining a balanced mix of social uses (Ajuntament de Barcelona, 2017b).

The conurbation of Barcelona is characterized by a significant heterogeneity in both its built environment as well as in its socioeconomic characteristics (Figures 24 and 25). Its urban form features a diversity of urban structures, such as historical towns, orthogonal expansions, high-rise housing projects, and residential urban sprawl areas. This results in different levels of population density (Figure 25a) and contact opportunity (Figure 25b). In terms of mobility, the conurbation of Barcelona is well-connected by a highly frequent public transportation system with varying levels of accessibility (Figure 25c). The conurbation also presents a socioeconomically diverse composition, with a population that has a varying socioeconomic status and various levels of vulnerability (Figure 25d). These urban realities partially interact in space with tourist flows, which tend to concentrate in the historical neighborhoods of the city center, but are also increasingly spreading to less central areas (Figure 25e).

Figure 25. Built environment and socioeconomic characteristics of the study area: a) population density, b) contact opportunity, c) accessibility, d) urban vulnerability, e) concentration of tourist accommodations.



Source: own elaboration.

For the analysis, census tracts as spatial units were used. However, for the visual representation of the data, the study area was divided in 19 subareas that are approximately equal in size and correspond to the districts within the city of Barcelona and its surrounding municipalities.

8.2.2.2. Outcomes: Retail and Facility data

To analyze diversity, data from retail venues and day-to-day facilities were used. The study utilizes the ground-level retail inventory of the City of Barcelona (Barcelona City Council, 2019), which has been used extensively in previous studies (Anguera-Torrell & Cerdan, 2021; Crosas & Gómez-Escoda, 2020; X. Garcia et al., 2020; Gómez-Escoda et al., 2022; Goossensen et al., 2023; Londoño-Cañola et al., 2023; Morcuende & Lloberas, 2022). However, a methodological gap does exist in the City of Barcelona, as previous research has only considered the administrative city boundaries and does not take into account the actual city, which includes the adjacent municipalities. In order to fill this gap, various databases were merged to cover the conurbation of Barcelona. For the adjacent municipalities, the Census of Commercial Establishments of Catalonia was used (Camerdata, 2020). Additionally, this study also uses the facility dataset of the Metropolitan Area of Barcelona (AMB, 2019) to obtain the location of day-to-day facilities such as health providers, cultural venues, and education centers, which were not present in the Camerdata (2020) dataset. To merge the three databases, there were only activities that were comparable across all municipalities in the conurbation were considered, resulting in a total of 17 categories: health and social assistance, education, food retail, convenience goods (non-food), personal services, personal equipment, household equipment, repairing, cleaning and maintenance services, cultural facilities, sports, leisure, restaurant and bars, finance, real estate, motor vehicle goods and services, and others. The reclassification of these categories drew inspiration from previous works conducted within the Barcelona context (Porta et al., 2012; Yoshimura, Kumakoshi, et al. 2021). For further information on the disaggregated categories of retail venues and facilities, refer to Table 9 in the *8.2.7. Supplemental Material*.

This data diversity was measured by means of the Commercial and Facility Mix (CFMIX) index (Table 5), which is an adaptation of traditional measures of entropy, such as those used to describe land-use mix (Frank et al., 2010). This indicator was calculated at the census tract level, based on the 17 categories, extracted from the retail and facility activities datasets, and described by the following expression:

$$Diversity\ (CFMIX) = -1\left(\frac{\sum_{i=1}^{n} pi * \ln(\mathrm{pi})}{\ln(n)}\right.$$

where *pi* refers to the proportion of the activity type *i* in the census tract considering all activities, and *n* is the total number of activity types. The proportion of each retail and facility activity per census tract was calculated (Table 5), as follows:

$$Activity\ type\ weight\ (\%) = \frac{n\ activity\ type\ X}{N}$$

Where *n* refers to the number of venues of a certain type of activity, and *N* refers to the total number of venues.

Table 5. Summary of the data.

Type of variable	Variable	Original resolution	Transformations
Outcome	Retail and Facility Mix Indicator (0-1) [a,b,c]	points	point count (sum)
	Proportion of retail/facility type (n type/ n total)[a,b,c]	points	point count (sum)
Built environment covariates	Commercial ratio (% commercial use/built surface)[d]	block	spatial join (mean)
	Net Density of Population (n inhabitants/ km2)[e]	grid (quadtree)	spatial join (mean)
	Acessibility (z-score)[f]	grid (100x100m)	spatial join (mean)
	Contact opportunity (z-score)[f]	grid (100x100m)	spatial join (mean)
Socioeconomic covariates	Urban vulnerability index (1 low -10 high)[g]	Metropolitan Statistical Areas	spatial join (mean)
	Tourist accommodation ratio (% tourist accommodation units/total housing units)[h]	census tract	not applicable

Source: [a]Retail inventory in a Ground level of the City of Barcelona 2019, Barcelona City Council; [b]Census of Businesses in Catalonia CAMERDATA 2019, Chamber of Commerce. [c] Facilities Viewer 2019, Metropolitan Area of Barcelona. [d]Municipal Cadaster 2017, National Statistical Institute (INE). [e]Georreferenced population of Catalonia 2016, Statistical Institute of Catalonia (IDESCAT). [f] Gómez-Varo et al. (2022). [g] Antón-Alonso & Porcel (2021). [h]Measurement of the number of tourist homes in Spain and their capacity 2020, National Statistical Institute (INE).

8.2.2.3. Covariates: built environment and socioeconomic characteristics

To analyze the factors that influence diversity, the study collected data on the characteristics of the built environment, as well as the socioeconomic characteristics of the spatial units in the study area. Considering the different spatial resolution of each variable, they were rescaled at the census tract level using the *Spatial Join* tool of ArcGisPro software (ESRI), under different calculation rules (Table 5).

As built environment characteristics the commercial ratio, population density, accessibility and an indicator of contact opportunity were included. The *commercial ratio* was calculated using the Municipal cadastre (2017), originally provided at a building level, indicating the proportion of commercial use within the total built surface area. The *net population density* indicates the number of inhabitants per km2, which was extracted from the Georeferenced population of the Catalonia database (2016) and calculated for a quadtree grid, with a maximum resolution of 62.5 m and a minimum threshold of 17 inhabitants. Based on the previous work of Gómez-Varo et al. (2022) on the assessment of urban vitality in Barcelona, *accessibility* and *contact opportunity* indicators were extracted. They have been originally calculated for a 100 x 100 m grid and are expressed in z-score values. The *accessibility* indicator is composed of variables about spatial access to the public transport network, as well as pedestrian-oriented street design (i.e. street lightning, traffic-calmed areas). The *contact opportunity* indicator measures street network characteristics (i.e. intersections, presence of meeting points) and microelements of the built environment (i.e. the presence of benches) that encourage human interactions.

Regarding the area-level socioeconomic characteristics, a measure of urban vulnerability and the proportion of tourist accommodation in each census tract were included. The Index of Urban Vulnerability (IUV), developed by the Institute of Regional and Metropolitan Studies of Barcelona (Antón-Alonso and Porcel, 2021), was utilized to gauge urban vulnerability. The IUV comprises measures of social and residential exclusion and their related effects. It expresses values on a scale of 1 to 10 (from less to more vulnerable) and was initially calculated for the spatial unit of Metropolitan Statistical Areas (MSA), which are considered sub-city territorial units of reference in the metropolitan area of Barcelona. We have employed a housing-related indicator as a proxy to assess tourism pressure, considering its significant impact on urban fabric in terms of housing market inflation and the influx of floating population into neighborhoods (Cocola-Gant, 2018). Specifically, we utilized the variable "proportion of tourist accommodation", which represents the percentage of tourist accommodation units in relation to the total number of housing units. This variable was derived from georeferenced data sourced from the measurement of the number of tourist dwellings in Spain and their capacity (INE 2020). The original calculations were performed at the census tract level.

The distribution of all variables after their calculation at a census tract level is found in the *8.2.7. Supplemental material*, Table 10.

8.2.2.4. Analysis

The analysis undertaken in this research followed three main steps. The first step of the analysis aimed to understand the association between retail and facility diversity and the characteristics of the built environment, as well as area-level socioeconomic factors. To do this, Diversity was used as the dependent variable, and built environment and socio-economic characteristics were used as independent variables. The explanatory variables were scaled prior to regression modeling. Given the nature of the dependent variable, which was bounded between 0 and 1 and had a concentration of values at the extremes, the analysis uses a generalized linear model with a binomial distribution and a logistic link function.

For the second step, the study examines what the diversity was composed of, in terms of the proportion of the different retail and facility activities within neighborhoods, and in relation to different levels of diversity and socioeconomic realities. Census tracts were classified based on their diversity score (CMIX), their vulnerability score, and the proportion of tourist accommodation, by means of a Multivariate Analysis Cluster. To do so, the ArcGisPro tool was employed, which is based on the K-Means algorithm to create clusters with similar features. This tool was used to generate a mean center for each group. The number of clusters was determined by applying the silhouette method to the data, which produced an F-statistic score that indicated 4 as the optimal number of clusters (F-statistic = 0.453), as shown in Table 11 in the *8.2.7.Supplemental Material*. However, 5 clusters (F-statistic = 0.425) were selected since it was observed that some census tracts had extremely high values for the proportion of tourist accommodation. An additional cluster allowed to distinguish these areas where the proportion of tourist accommodation was significantly higher. Furthermore, the results did not vary significantly in comparison to the score for 4 clusters.

Finally, the third step aimed to explore the specific retail and facility activities of each cluster. To do so, the mean of the proportion of each activity type was calculated per cluster group and compared these metrics using an ANOVA test. Data analysis was conducted using SPSS software (IBM).

8.2.3. Results

8.2.3.1. The association between diversity, built environment and socioeconomic characteristics.

Initially, an analysis was conducted to examine how areas with high diversity scoresare associated with specific built environment and socioeconomic attributes (Table 2). Regarding the variables of built environment, a strong positive relationship was found between diversity and contact opportunity (0.901), commercial ratio (0.743) and density of population (0.161). With regard to accessibility, the analysis revealed a positive association with diversity (β=0.224); however, the effect was weaker and not statistically significant. In terms of the socioeconomic variables, the results showed that urban vulnerability (β=-0.128) and presence of tourist accommodation (β=-0.111) were negatively associated with diversity. Of the two, only urban vulnerability exhibited a statistically significant relationship with diversity.

Table 6. Generalized linear model regression (binomial distribution and a logistic link) of the retail and facility mix score.

	Std. Coef. (S.E.)
Built environment characteristics	
Commercial ratio (% commercial use/built surface)	0.18 (0.069)**
Net population density (n inhabitants/ km2)	0.168 (0.070)*
Accessibility (z-score)	0.224 (0.161)
Contact Opportunity (z-score)	0.901 (0.161)***
Social environment characteritics	
Urban vulnerability (1 low -10 high)	-0.128 (0.063)*
% touristic accommodation	-0.111 (0.057)

*Source: own production. Significance test: *p-value < 0.05, **p-value < 0.01, ***p-value < 0.001*

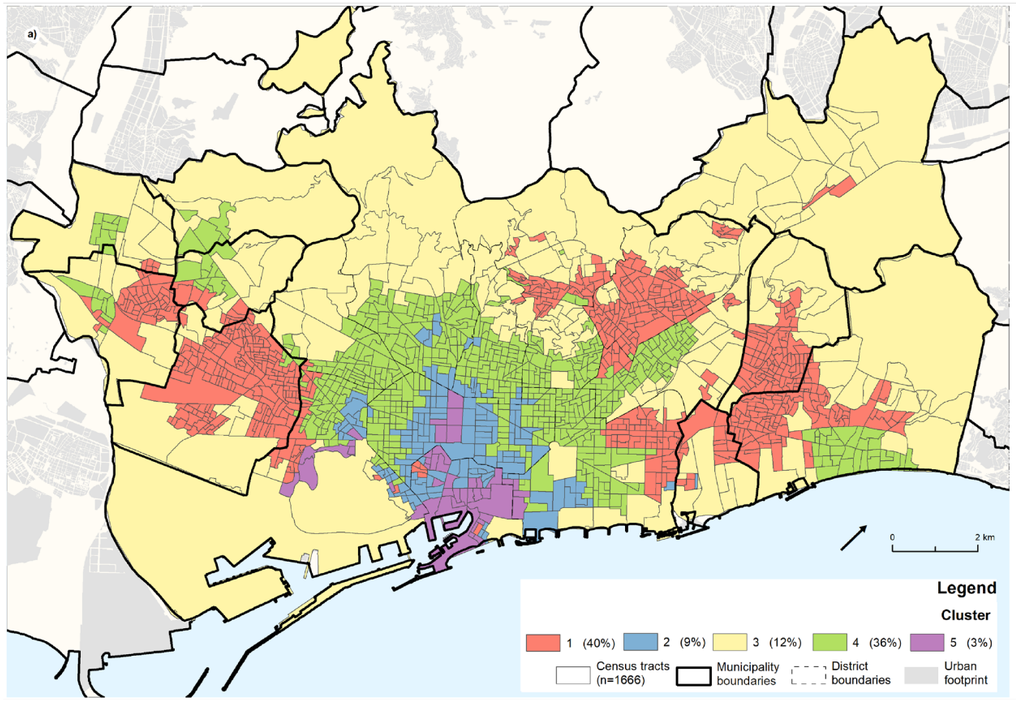
8.2.3.2. Territorial clustering based on diversity levels and socioeconomic characteristics.

Based on the diversity, vulnerability, and proportion of tourist accommodation scores of the census tracts within the study area (n=1666), 5 distinct clusters were obtained (Figure 26 and Table 7). To further develop the analysis, the mean proportion of each activity type was calculated in relation to the total activities for the study area overall, and compared these values across different cluster types using an ANOVA test with a p-value indicator (Table 7).

Overall, the Barcelona conurbation exhibits a high diversity score (0.71), an intermediate level of vulnerability (5.65), and a low presence of tourist accommodation (1.63). The study area is primarily characterized by the presence of restaurants and bars (21.49%), convenience food retail (15.42%), and personal services (10.17%). A group of activity types, including education (6.54%), health and social assistance (6.1%), convenience goods (5.47%), and household equipment (5.13%), follow with a proportion between 5-7%, representing basic services and equipment. The remaining categories have a proportion of 1-4%. However, the score variables

and the proportion of activity types vary depending on the cluster, as explained below.

Figure 26. Clusters according to diversity, vulnerability, and proportion of tourist accommodation scores.



b) Median and interquartile range (IQR) of diversity, vulnerability and % tourist accommodation scores at the census tract level, per cluster type.

	Cluster					Total
	1	2	3	4	5	
N	674	143	207	597	45	1666
Diversity (0-1)	0.75 (0.10)	0.75 (0.07)	0.36 (0.20)	0.78 (0.07)	0.60 (0.15)	0.71 (0.14)
Vulnerability (1 less-10 more vulnerable)	8.28 (2.00)	3.62 (3.00)	5.96 (4.00)	3.07 (2.00)	5.49 (2.00)	5.65 (5.00)
% tourist accommodation (0-100)	0.56 (0.80)	5.89 (2.45)	0.81 (0.75)	1.25 (1.60)	13.00 (2.30)	1.63 (1.80)

Source: own elaboration.

Table 7. Summary of Clusters.

Type	Key characteristics	Where
Cluster 1 *Mostly Peripheral high-density and vulnerable everyday neighbourhoods* (n=674; 40% of census tracts)	Socially disadvantaged populations with limited tourist activity that maintain high retail and amenity diversity, closely linked with daily needs and social reproduction.	Conurbated towns of Barcelona, such as L'Hospitalet de Llobregat (14), Cornellà de Llobregat (12), Santa Coloma de Gramenet (19), northwest of Sant Adrià del Besòs (16) and Badalona (11). Peripheral districts of Barcelona such as Sant Martí (10), Horta Guinardó (7), Nou Barris (8). Exceptionally, the Raval neighbourhood in the central historic district of Ciutat Vella (1).
Cluster 2 *Diverse and socially privileged historic hospitality cluster* (n=143; 9% of the census tracts)	Neighbourhoods with socially privileged population and considerable presence of tourism. High diversity but the most prominent activities are restaurants and bars, leisure retail and personal and household equipment.	The inner-city urban expansion of Barcelona, the district of Eixample (2). West of the historic central district of Ciutat Vella (1). Historic inner-city cores of Sants-Montjuic (3), Gràcia (6) and Sant Martí (10).
Cluster 3 *Infrastructure and Facilities-focused in Limiting areas* (n=207; 12% of the census tracts)	Low diversity areas with moderate vulnerability and minimal presence of tourist activity. Prominent proportion of basic services such as health, education, and cultural and sports facilities.	In limiting areas bordering natural boundaries (mountains, rivers). Within urban fabric, close to large infrastructures, industrial areas and large parks. Seafront of Sant Martí (10), Sant Adrià del Besòs (16) and extremes of Badalona (11).
Cluster 4 *Well-balanced and socially privileged in decentralized urban cores* (n=597; 36% of the census tracts)	Neighbourhoods with socially privileged population and scare relative presence of tourist activity. High diversity, where primary retail and services (food retail) and less essential activities (leisure, cultural facilities) are found.	Ring around central Barcelona: Les Corts (4), Sarrià-Sant Gervasi (5), north of Gràcia (6), Horta-Guinardó (7), Sant Andreu (9), Sant Martí (10). Central coastal areas of Badalona (11). Central part of Sant Joan Despí (17) and Sant Just Desvern (18).
Cluster 5 *Historic tourism hub* (n=45; 3% of the census tracts)	Specific areas with moderated social vulnerability and extremely high presence of tourist accommodation, where most of retail activities are dedicated to hospitality, food and beverage services.	Historical town of Ciutat Vella (1). Central streets of the inner orthogonal expansion of Eixample (2). Poblesec historical neighbourhood in Sants-Montjuic (3) district.

Source: own production.

Firstly, covering the 40% of the census tracts (n=674), *Cluster 1* presents high values of diversity (0.75) and vulnerability (8.28), and low proportion of tourist accommodation (0.56). Regarding the proportion of each retail and facility activity, *Cluster 1* is characterized by higher percentages than the overall mean in the categories of convenience food retail (18.44%), personal services (11.17%), cleaning services (2.79%), and real estate agencies (4.3%). In contrast, personal equipment (4.71%), sports (0.91), and leisure (1.76%) have relatively lower values than the overall mean. Census tracts of this cluster are mainly placed in conurbated municipalities, while are also represented in some peripheral areas of Barcelona. They correspond to adjacent towns of *L'Hospitalet de Llobregat* (14), *Cornellà de Llobregat* (12), *Santa Coloma de Gramenet* (19), and the Northwestern parts of *Sant Adrià del Besòs* (16) and *Badalona* (11). Regarding the spots within the city of Barcelona, they are mostly located in the peripheral neighbourhoods of the east of *Sant Martí* (10), *Horta-Guinardó* (7) and *Nou Barris* (8), although a small group of 3 census tracts were also found in the historical area of Barcelona, in the Raval neighbourhood of the *Ciutat Vella* district (1).

Second, composed by 9% of the census tracts (n=143), *cluster 2* is defined by high values of diversity (0.75), but low values of vulnerability (3.62) and a moderate proportion of tourist accommodation (5.89). This cluster stands out for the categories that have a proportion higher than the overall mean. These categories include bars and restaurants (29.07%), leisure (4.12%), personal equipment (8.44%), and household equipment (5.73%). However, the remaining categories have values that fall below the overall mean, and among them, health and social assistance (4.56%), education (4.14%), repairing (2.78%), and cleaning services (0.38%) are notable. This cluster covers most part of the central neighbourhoods of the *Eixample* district (2), the western parts of the historical core of *Ciutat Vella* district (1) and the historical cores of *Sants-Montjuïc* district (3) and Poble Nou neighbourhood in *Sant Martí* district (10).

Cluster 3, representing 12% of the census tracts (n=207), conversely, has a low score on diversity, and present moderate vulnerability (5.96) and low presence of tourist accommodations (0.81). Regarding the weight of the different activity types in this cluster, those who have a prominent proportion above the overall mean include basic services such as health and social assistance (8.42%) and education (12.74%), as well as cultural and sport facilities (7.02% and 2.86%, respectively), and real estate agencies (5.15%). Conversely, are notable below the overall mean the proportion of convenience food retail (11.23%), personal services and equipment (5.38% and 2.71%, respectively), and the leisure category (1.19%). The census tracts of this cluster mainly correspond to the limiting areas of the conurbation, bordering natural boundaries such as the mountains and rivers, although some spots are also found within the urban fabric. They correspond to certain spaces on the seafront, and locations where large transport infrastructures are found, as well as some industrial areas and large parks.

Cluster 4 covers 36% of the census tracts (n= 597) and is characterized by high values of diversity, low values of vulnerability (3.07) and a moderate proportion of tourist accommodation (1.25). This cluster covers areas mostly found in the city of Barcelona, forming a ring that starts in the limiting census tracts of *Eixample* district (2) and expands to certain areas of its contiguous districts, such as *Les Corts* (4), *Sarrià-Sant Gervasi* (5), *Gràcia* (6), *Horta-Guinardó* (7), and some areas of *Sant Andreu* (9), and *Sant Martí* (10). Additionally, census tracts belonging to this cluster were also found in the coastal areas of *Badalona* (11), in the central part of *Sant Joan Despí* (17) and *Sant Just Desvern* (18), and in some neighbourhoods of *Cornellà de Llobregat* (12) and Sant Feliu de Llobregat (13). In this cluster the proportion

of retail and facility types is fairly aligned with the overall values. The categories that surpass the general mean percentage include health and social assistance (7.07%), personal services and equipment (11.6% and 6.64%, respectively), leisure (3.15%), and banks (3.29%). On the other hand, categories with a lower mean percentage are cultural facilities (2.35%).

Table 8. Proportion (%) of retail and facility activities, per cluster.

		Cluster					
Category	**Subcategory**	**1**	**2**	**3**	**4**	**5**	**Total**
Basic services and equipment	Convinience food retail	18,44	13,52	11,23	14,18	11,94	15,42
	Education	5,93	4,14	12,74	5,78	4,89	6,54
	Health and Social Assistance	5,06	4,56	8,42	7,07	3,11	6,1
	Convinience goods (non food)	5,31	5,04	6,1	5,57	4,89	5,47
Personal	Personal services	11,17	9,33	5,38	11,16	6,7	10,17
	Personal equipment	4,71	8,44	2,71	6,64	11,95	5,67
Household	Household equipment	5,41	5,73	3,99	5,27	2,69	5,13
	Reparing	4,44	2,78	5,39	4,14	1,75	4,23
	Cleaning services	2,79	0,38	2,95	1,16	0,42	1,96
Entertainement	Cultural facilities	3,56	2,61	7,02	2,35	4,02	3,49
	Leisure	1,76	4,12	1,19	3,15	3,47	2,44
	Sports	0,91	1,36	2,86	1,64	1,09	1,46
Restoration & Hospitality	Food, beverage, and hospitality	20,45	29,07	19,21	20,45	37,63	21,49
Finances	Real Estate Agencies	4,3	2,01	5,15	3,43	0,98	3,81
	Banks	2,86	2,62	2,21	3,29	1,36	2,87
Others	Motor vehicle goods and services	1,16	0,69	1,51	1,2	0,35	1,16
	Others	1,73	3,57	1,91	3,48	2,69	2,56
	Total	100	100	100	100	100	100

Source: own production.

Finally, *Cluster 5* covers only 3% of census tracts (n= 45) and presents moderate values of diversity (0.60) and vulnerability (5.49), and an extremely high proportion of tourist accommodation (13.00). *Cluster 5* exhibits the most differentiated percentages in terms of activity distribution compared to the overall percentage. Undoubtedly, the category that stands out the most in terms of percentages above the global average is restaurants and bars (37.63%), which is significantly higher than the other clusters. However, there are also higher percentages in personal equipment (11.95%), cultural facilities (4.02%), and leisure (3.47%). Categories that are notably below the average include health and social assistance (3.11%),

convenience food retail (11.94%), personal services (6.7%), household equipment (2.69%), repairing (1.75%), cleaning services (0.42%), and real estate agencies (0.35%). The census tracts of this cluster correspond to a very particular areas located in the historical town of *Ciutat Vella* (1), including Barceloneta (the seafront neighbourhood), and also some tracts situated in the central streets of *Eixample* district (2) and Poblesec neighbourhood of *Sants-Montjuïc* district (3).

8.2.4. Discussion

Higher retail and facility diversity levels are generally found in denser areas that promote contact opportunity, such as those characterized by high levels of residential activity and density of intersections. This is consistent with the central theory of Jane Jacobs on the "conditions for diversity," which include population density and short-distance blocks with numerous intersections (Mohareb et al., 2016). The findings also suggest that a higher density of commercial activities is associated with a greater diversity of other types of activities, contrary to earlier findings. For example, in Tokyo, areas with high commercial density often exhibit low diversity scores (Kumakoshi et al., 2021). In addition, accessibility (i.e. the presence of walkable and well-connected environments with public transportation) has also been found to be positively associated with greater diversity levels.

Results suggest that diversity is negatively associated with urban vulnerability and the relative presence of tourist activity in Barcelona. Specifically in this case study, socially disadvantaged neighbourhoods tend to have less diverse retail and amenity landscapes. This contradicts previous research that using a Jacobsian approach to built environment determinants of vitality, to establish that the potential for urban vitality was not relegated to central, privileged areas of the city but rather extended to peripheral and often vulnerable neighborhoods (Delclòs-Alió & Miralles-Guasch, 2018b; Gómez-Varo et al., 2022). While prior studies suggested that the vulnerability of the population does not influence the potential for urban vitality when examined as a whole (the topic of a forthcoming study), these results suggest that urban vulnerability might share a negative relationship with diversity, meaning that in areas with high vulnerability (i.e. areas with high levels of poverty, ageing, high presence of low-income immigration, residential degradation, high residential concentration, and low residential attraction) a significant drop is found in retail diversity levels along with facility-diversity levels. Additionally, these findings evidence that higher touristic activity is also negatively associated with diversity of retail and facilities. This is consistent with earlier research that points to the specialization of certain activities and the resulting loss of urban diversity (Anguera-Torrell and Cerdan, 2021).

Beyond these general trends, however, these results point to the existence of different pathways in the specialization of urban areas with regards to the triad of vulnerability, touristification, and diversity. As an example, areas in *Cluster 1* are mainly located in peripheral areas, which correspond to urban cores located far from the city centre and conurbated municipalities. These areas are characterized by socially disadvantaged populations – presenting a high score in the Index of Urban Vulnerability - and have limited tourist activity. However, they maintain high retail and amenity diversity. These areas were mainly developed in the 1960 to 1970s to house working-class migrant populations. The retail trade in these areas is primarily residential-oriented, with the most prevalent types of stores being basic personal services, local restaurants, and a limited selection of leisure and entertainment retail options, such as clothing. These areas were originally designed, and to an extent still are, "dormitory cities", which are monofunctional urban areas by design that have later developed retail and facility-

environments which are closely linked with daily needs and social reproduction (Marmolejo Duarte and Cerda Troncoso, 2017). These has been accompanied by a regional concentration of non-essential retail in central areas forming agglomeration economies (Trullén i Thomas, 2002), and the emergence in peripheral metropolitan enclaves of shopping malls that concentrate leisure and non-essential activities (Codina et al., 2019). The lack of leisure and non-essential retail and facilities within the urban fabric of these areas is suggested to have a negative impact on neighborhood proximity dynamics for achieving the goal of a 15-minute city neighborhood, rendering them as places with limited activities and opportunities,g"nowhere to go" or "nothing to do but sit" (Christian et al., 2017). Consequently, leisure activities can be limited mainly to visiting bars (Gómez-Varo et al., 2023), which could be problematic in terms of public health concerns.

High-diversity areas are also found in socially advantaged neighborhoods – with the presence of middle-high class population and high residential attraction - that could classify into two groups based on the presence of tourist accommodation. First, those neighborhoods with socially privileged population and a scarce relative presence of tourist activity, where primary retail and services are found, such as food retail, as well as less essential activities such as those performed in leisure or cultural facilities (*cluster 4*). This may suggest that the combination of a low vulnerability with a low presence of tourism leads to a greater balance in the distribution of different retail activities and amenities. These are areas forming a ring around the central areas of the Barcelona urban layout, as well as some central neighborhoods in adjacent municipalities. Residents living in these areas display a greater degree of satisfaction with their neighborhood compared with other city inhabitants (Ajuntament de Barcelona, 2021), which could be attributable to their ability to self-select their residence location because of their privileged situation. This may be of relevance for urban practice aiming to democratize the wellbeing and happiness of residents, which could be achieved by a well-balanced and diverse retail and facility activities within the neighborhoods.

Second, there are sections where the presence of tourism is greater, and where the most prominent activities are restaurant and bars, leisure retail, and personal and household equipment (clothing and furniture) (*cluster 2*). These areas correspond to the central parts of the *Eixample* urban layout, the westernmost part of the historic district, where a large portion of commercial activity from major brands is concentrated, particularly on certain shopping streets, in combination with existing traditional retail. This cluster also includes the old historic cores such as *Sants*, Gracia, and Poble Nou, that were independent before the annexation of Barcelona, and whose diversity is explained by their long tradition of proximity dynamics, facilitated by their compact urban form with narrow streets and squares, and their connection to central Barcelona (Masip-Tresserra, 2016). These areas have recently become scenarios for the extension of tourist destinations in the city. As proposed by Judd and Fainstein (1999), historical urban designs have an advantage in generating placemaking. This is because urban tourism overlays onto the structure of old streets and buildings, and visitors actively seek to immerse themselves in traditional neighborhoods through the retail landscape and the vibrant everyday activities (Mansilla and Milano, 2019). However, paradoxically, the presence of a tourist-based floating population has affected the retail network, leading to a loss of traditional diversity (Milano et al., 2023). As a result, there is a growing demand for urban policies regulating land uses to prevent dynamics of monopolization of certain activities, such as bar terraces and tourist accommodations. Lower diversity levels can be found in areas with a greater presence of tourist accommodation, where almost 40% of retail activities are dedicated to hospitality, food and beverage services (*cluster 5*). These specific areas can be found in places in very particular locations, such as the old town fabric and the

seafront neighborhood of *La Barceloneta*, which, as previous studies have largely shown, have undergone processes of urban renewal that have contributed to the gentrification and *touristification* of the neighborhoods, resulting in changes in the commercial structure and daily activities of the areas (Pascual-Molinas and Ribera-Fumaz, 2008). This phenomenon, defined as *overtourism*, has been identified in many tourist cities around the world, bringing with it the thematization of neighborhoods and the homogenization of urban landscapes, leading to significant losses in city diversity and serious consequences for urban life, such as displacement of population, neighborhood discontent and lack of everyday services (Sánchez-Ledesma, et al. 2020).

Despite the contributions of this paper to the understanding of diversity of retail and facility activities, the present study has some methodological limitations. First, merging two databases from different sources, which were systematized using different methodologies, resulted in the exclusion of some categories and the recategorization of certain businesses. While this reduced the specificity of activity types, it allowed for an analysis of diversity beyond Barcelona's administrative boundaries, incorporating the metropolitan area and neighbouring municipalities. Second, there is a limitation regarding the timeframe of the databases. Although the databases used are quite recent (from 2019 and 2020), it is noteworthy that, as suggested by previous works (Frago, 2021; Morcuende & Lloberas, 2022) , the effects of the pandemic and the virtualization of commercial activity may have led to the recent disappearance of the street retail sector. Third, the database used lacked qualitative information that would have been relevant for analyzing the diversity of activities, such as the price range of these commercial establishments, the age of the businesses, the type of clientele they serve, and the inclusion of brands and major retailers, among other characteristics. Incorporating these variables would provide valuable insights into the diversity of activities, as suggested by other researchers who have explored commercial diversity by considering a broader range of factors (Dolega et al., 2019). For instance, a commercial activity could meet the needs of both the local population and the floating population, as suggested by some studies on the *gourmetization* of certain everyday services (Gonzalez, 2018). Therefore, further analysis is necessary to incorporate such information into the assessment of diversity. In this sense, future research should also consider additional indicators beyond variables used as proxies to approximate different socioeconomic and tourist realities. For example, the proportion of tourist accommodation may not capture the full impact of tourism on commercial activity, particularly in peripheral neighborhoods with tourist attractions where daily floating populations may have a significant effect on diversity (Antunes et al., 2020). Further, to approach socioeconomic characteristics, some authors are using other variables such as housing prices (Ren et al., 2021). Finally, there is an inherent limitation in aggregating the data on retail and facility activities at the level of census tracts, and utilizing them as the spatial unit of analysis. These limitations are related to a classical methodological issue in geography studies known as the Modifiable Areal Unit Problem (MAUP), which suggests that the chosen spatial partitioning of the census tracts may influence the results (Jelinski and Wu, 1996).

8.2.5. Policy and research implications

Overall, our research findings contribute significantly to the ongoing academic discourse surrounding social vulnerability, tourism management, and the significance of diverse retail and infrastructure. Policymakers widely acknowledge the importance of protecting and promoting diversity in retail and activities within neighbourhoods, recognizing it as a crucial element that shapes urban landscapes and fosters social cohesion. Notably, recent measures implemented in global cities like Paris to revitalize the local economy have been viewed

positively (Mairie de Paris, 2018). For instance, initiatives aimed at facilitating locally-driven fair trade projects, using vacant commercial spaces, and integrating them into neighbourhood regeneration processes have emerged. Similarly, in Barcelona, the "Strategy for reinforcement and projection of commerce in Barcelona 2017-2019" has been implemented (Ajuntament de Barcelona, 2017a), acknowledging the essential role of commerce as an economic activity while also emphasizing its significance in social integration and equal opportunities.

The findings of this paper are also relevant to the policies being implemented in numerous cities worldwide that affect the retail and infrastructure landscape. These policies involve transformative planning strategies that propose changes in urban design aimed at creating peaceful environments and making them more walkable. The literature suggests that pedestrianized designs help enhance retail diversity and prosperity, although this has primarily been tested in specific central streets (C.-D. Kang, 2016; Yoshimura, Santi, et al., 2021). In Barcelona, similar traffic interventions have been implemented in recent years, notably the Superblocks Project. This project involves a traffic calming intervention that creates pacified interior roads, establishing a local network accessible by active modes of transportation, with retail establishments on the ground floors. Critical questions have been raised by authors like Anguelovski et al. (2023) regarding the equity implications of these interventions. They propose that when these implementations are confined to particular areas, they exclusively benefit middle-high-income population. To ensure that these interventions have a positive influence on socially disadvantaged groups, they should be implemented on a city-scale.

Therefore, it is important for future research to assess the specific impact of all these policies on the intricate relationship between retail and infrastructure diversity, social vulnerability, and tourism. For instance, it is necessary to examine the influence of retail diversity on the delicate balance between tourist activities and local needs. Additionally, further investigation is needed to determine whether diverse commercial activities can be effectively planned through targeted local policies or if they predominantly emerge from broader urban dynamics that go beyond the scope of land use planning and urban design. Furthermore, it is crucial to explore whether retail and infrastructure diversity also affect social vulnerability and the presence of tourism in the city, potentially contributing to the mitigation of vulnerability and preventing excessive tourism-driven transformations in specific urban spaces.

Moreover, it is worth considering that these targeted initiatives on retail and infrastructure may not be enough to reverse the loss of diversity or maintain it over time. Additional policies need to address global trends impacting retail, such as tourist pressure or the lack of affordable residential housing, which are closely interconnected in the context of Barcelona. These factors have a significant impact on the city's commercial landscape and, consequently, on diversity and neighborhood life, as previously highlighted by some scholars (Fresnillo, 2018).

8.2.6. Conclusion

The aim of this study was to provide a comprehensive understanding of retail and facilities diversity and its spatial distribution in relation with social vulnerability and tourism, in the particular context of Barcelona (Spain). Firstly, the objective was to understand the effects of both the built environment and socioeconomic factors on the distribution and intensity of diversity levels, which were examined through a regression analysis. While previous literature had investigated these dimensions separately, the combined relationship between these two dimensions on different degrees of diversity has not been well-studied. Secondly, the aim was to investigate how diversity is shaped and affected by different levels of social vulnerability

and tourist activity. Cluster analysis was used to identify different balances and pathways towards equilibrium between retail diversity, tourist activity intensity and social vulnerability.

These findings suggest that more diversity retail and facility environments tend to concentrate in dense and compact urban environments. These conditions of the built environment tend to promote the necessary contact opportunities, population density and residential activity necessary for a wide variety of business to thrive. These results also find, however, that retail and facility diversity is negatively associated with urban vulnerability and the presence of tourist activity.

In all, these results show that diversity cannot be considered a uniform and unique characteristic across the city, but rather is differently manifested in the retail and facility network, fluctuating based on local conditions of the built environment but also on city-level dynamics of vulnerability and touristic activity. On a local level, this study also contributes to identifying areas where diversity may be threatened by the overrepresentation of certain activities, thus offering insights for the development of urban policies that ensure activity diversification and promote inclusive and equitable urban environments.

Finally, the insights from this study open the door to new questions within current debates about the role of targeted interventions in land use and urban design to ensure the diversity of retail and infrastructure. Future research should prioritize assessing the specific effects of these policies on the intricate relationship between retail, infrastructure diversity, social vulnerability, and tourism.

8.2.7. Supplemental material

Table 9. Retail venues and day-to-day facilities included in each category.

Aggregated Category	Disaggregated categories
Health and social assistance	Primary care centres, medical consultations, hospitals, health stores (i.e. orthopaedic store).
Education	Nursery schools, primary schools, high schools, training schools, study centres, language schools.
Food retail	Convenience stores, small specialized stores, bakeries, supermarkets.
Convenience goods (non-food)	Drugstore, perfumery, pharmacy, herbalist, tobacconist, fuel station.
Personal services	Beauty salon, hair salon, barbershop, dry cleaner and laundry.
Personal equipment	Clothing, shoe shops, haberdashery, jewellery shop, watchmaking.
Household equipment	Appliance store, mattress stores, home decoration, household supplies, flower shops.
Repairing	Repair shops on household appliances, mechanical workshops.
Cleaning and maintenance services	Washing services, cleaning services, lift maintenance.
Cultural facilities	Public library, cultural centres, museums, municipal archives, exhibition halls, theatre, cinema, auditorium.
Sports	Sports centres, fitness centres.
Leisure	Music shops, toy shops, book shops, art shops, stationary.
Restaurant, bars and hospitality	Cafeterias, bars, restaurants, ice-cream shop, musical bars, pubs, clubs, hospitality.
Finances	Banks, insurance company offices, finance institutions.
Real estate	Real estate agencies, services of estate agencies.
Motor vehicle goods	Concessionaires, motorcycle shops, car renting.
Others	Travel agencies, photography shops, animal clinics.

Source: own production.

Table 10. Main characteristics of the sample (n=1666 census tracts).

	min	Q1	median	mean	Q3	max
Outcome						
Commercial and facilities diversity (0-1)	0,01	0,67	0,77	0,71	0,81	0,89
Built environment characteristics						
Commercial ratio (% commercial use/built surface)	1,89	33,03	41,03	41,18	48,88	87,97
Net population density (n inhabitants/ km2)	88,17	24347,5	46353,3	40970	61580	262200
Accessibility (z-score)	-1,4	-0,18	0,11	0,15	0,44	1,14
Contact Opportunity (z-score)	-1,29	-0,02	0,22	0,28	0,53	1,47
Social environment characteristics						
Urban vulnerability (1 low -10 high)	1	3	5,65	6	8	10
% touristic accommodation	0	0,2	1,64	0,7	2	41,3

Source: own production.

Table 11. F-statistic scores for different number of clusters.

N clusters	F statistic
2	0,41
3	0,41
4	0,45
5	0,43
6	0,38
7	0,36
8	0,29

Source: own production

8.3. Accounting for care in everyday mobility: an exploration of care-related trips and their sociospatial correlates in a Mediterranean Metropolis

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Accounting for care in everyday mobility: an exploration of care-related trips and their sociospatial correlates

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ABSTRACT
Since care is an essential part of our individual and collective survival, there is the challenge to explore how care operates through daily mobility patterns in urban settings. This paper utilizes the concept of 'mobility of care' to quantitatively assess care-related trips in the Barcelona Metropolitan Region (BMR) using an official household travel survey. We analyse the factors linked to care-related trips at the individual, household, and territorial levels and examine their correlation with transportation modes. Our results reveal that care-related trips form a significant portion of everyday mobility in a Mediterranean metropolis such as Barcelona. Notably, mobility of care is more relevant among women, increases with age and the presence of dependents in the household, particularly minors. Active modes of transportation, primarily in densely populated urban areas, dominate care-related mobility in Barcelona. Finally, our findings suggests that while the concept of mobility of care helps to conceptualizing a key part of our daily reality and helps identifying possible social inequalities, it is still necessary to account and understand specific care-related purposes. The study's findings will contribute to advancing research on the mobility of care and informing urban policymakers in their pursuit of sustainable and equitable cities.

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8.3.1. Introduction

In recent years, sociodemographic changes such as population ageing, reorganization of gender roles and new familiar models have interacted with the weakening of the welfare state to create a "crisis of care". In this context, feminist ethics assert the importance to understand care as a collective and public concern that arises from inherent interdependency of human existence (Carrasquer Oto, 2013; Power & Williams, 2019; Williams, 2017). The COVID-19 crisis has further evidenced the weight of everyday activities of care, such as buying groceries, looking after kids, visit and assist dependents or practising exercises for physical and mental wellbeing, among others (Springer, 2020). Activities that have been considered as indispensable to "maintain, continue, and repair our world so we can live in it as well as possible" (Fisher & Tronto, 1990). Under these circumstances, care represents a relevant issue that needs to be recognized, studied and taken into account in policymaking.

In the field of geography, even if the concern for care has been, to some extent, inherently linked to traditional research topics (e.g. social and spatial inequalities or environmental issues) (Lawson, 2007), there is an upgrowing number of scholars that are placing care at the heart of their research, examining how care activities are influenced with everyday spaces and practices (Wiesel et al., 2020). Mobility studies in particular, have begun to address this issue by reporting those trips related to daily care activities, often under the lens of gender studies (Barker, 2011). The innovative term of "mobility of care", coined by Sanchez de Madariaga (2013), has helped to visualize a domain of trips that are usually associated with women, mainly related to home and caring tasks (Sánchez de Madariaga, 2013). This umbrella term has been recently recognised by policymaking institutions as an strategic concept to guide public transport policies in terms of gender equality (European Commission, 2013), and is also gaining academic relevance in the fields of urban planning, mobility and transport studies.

Studies to this date focusing on mobility of care have mostly done so from a qualitative and experiential perspective (Croucher et al., 2020; Grant-Smith et al., 2017; Jirón & Gómez, 2018; Ravensbergen et al., 2020; Sersli et al., 2020). While such approach not only is valuable but can should also be regarded as critical, there is still a need to quantify and provide a comprehensive depiction of mobility of care and its determinants. In this sense, there is a glaring lack of quantitative studies on mobility of care due, in part, to methodological difficulties in assessing care-related trips (Sánchez de Madariaga, 2013; Sánchez de Madariaga & Zucchini, 2019). In order to help bridge this gap, we aim to quantify mobility of care and examine its sociodemographic and territorial correlates by means of an official household travel survey. in the Barcelona Metropolitan Region (Spain), one of the largest metropolitan areas in the Mediterranean Region.

8.3.2. Previous research

8.3.2.1. Defining and accounting for care

The need to revaluate caring tasks is gaining momentum both in the academic field and in public policy around the world (European Commission, 2013; United Nations, 2021). The discussion about caring tasks, however, originated among sociologists in the 1980's, triggered by pioneering contributions by Italian scholars such as Balbo (1989), Bimbi (1985) and Saraceno (1980), who introduced what they named as "*il lavoro di cura*" (Torns Martín, 2008). For these authors, the concept of care mainly referred to time spent in activities that had traditionally remained invisible in welfare societies, and which was mostly carried out by women. Such activities included daily shopping, cooking, taking care of dependents, house organization and maintenance, and daily errands, among others.

To this date, however, there is no consensus about a clear definition of what care involves, and so scholars have outlined different aspects of what care means depending on their theoretical backgrounds, sociocultural contexts and methodological approaches (Carrasco et al., 2011). For instance, care has been defined as "*physical and emotional labour*" for the well-being of others (Conradson, 2003). According to Graham (1983), it could also be defined as labour that is not comparable to that operating under the rules of market production, as it is built upon emotional ties (Graham, 1983). Given the interdependency of human relationships (Groenhout, 2004), other have defined care as those activities that support others, either directly or indirectly (Folbre, 2006). Aside from the relational implications of care, other authors also consider a "self-care" dimension, which is also socially necessary (Fine, 2005; Folbre, 2006; Wilson, 1994).

These theoretical approximations opened an opportunity to account for care activities in analyses of social issues and everyday life. Some authors initially denounced the omission and undervaluation of the care dimension and domestic work in fields such as statistics (Benería, 1992; Reid, 1934), and to this date many other authors have attempted to measure caring tasks in different fields such as sociology (Duffy et al., 2013), labour (Chant & Pedwell, 2008), economy (Folbre, 2006; Serrano & Carrasco, 2006), public policies (Budlender, 2008) and public health (Hoefman et al., 2017; L. Y. Kim et al., 2018).

In the field of human geography, recent studies have also been concerned about this issue and have also contributed to account for care too (Middleton & Samanani, 2021). More specifically, transport and mobility studies have recently started to explore the role of care strategies and the reproductive sphere in daily mobility and travel behaviour (A. Balcom Raleigh et al., 2019; Croucher et al., 2020; Gilow, 2020; Scheiner & Holz-Rau, 2017). In this sense, mobility is studied not as an object of analysis but as an approach through which we can reveal and further understand the spatial structure of care tasks (Jirón & Imilán, 2018).

8.3.2.2. Mobility of care: what is it and how is it studied?

Within the field of mobility research, the term "mobility of care" is gaining acceptance as a new concept to study care trips. Coined by Sanchez de Madariaga (2013), mobility of care refers to "*all trips resulting from home-and-caring responsibilities (escorting others, everyday shopping, household maintenance, organization and administrative errands and visits to take care of sick or older relatives)*" (Sánchez de Madariaga, 2013). If previous research had examined the role of care by focusing on specific trip purposes (e.g. house-related errand or accompanying other household members), the new "mobility of care" concept aims to be an umbrella term that brings several trip purposes together under one single framework. By doing so, it highlights the relevance of mobility in the context of everyday life, and "provides a perspective for recognizing and revaluing non-paid care work by evaluating the trips that women and men are caring for others and the home" (opus cit.).

In this context, a growing number of case studies are using the term mobility of care to discuss gender differences in mobility patterns in different geographic contexts (Blumenberg, 2016; Gimenez-Nadal et al., 2016; Gimenez-Nadal & Molina, 2016; Haynes et al., 2019; Maciejewska et al., 2019; Mejia-Dorantes, 2019; Xie & Spinney, 2018). Among such studies, a

smaller number of scholars are placing "mobility of care" in the centre of their research, and particularly focusing in specific demographic groups such as women (Gilow, 2020; Grant-Smith et al., 2017; Jirón & Gómez, 2018; Sersli et al., 2020) and seniors (Croucher et al., 2020). Such studies mostly consist of qualitative approaches that provide an in-depth account of their mobility experiences, daily strategies and efforts required by the management of family and household, and the trips that resulted from their responsibility as caregivers. However, to this date, there is a general lack of quantitative evidence of what mobility of care represents, with only some recent exceptions (Zuccini & Madariaga, 2020).

The lower number of quantitative examinations of mobility of care is in part due to inherent biases and omissions in most travel survey designs. In other words, the way in which mobility surveys have traditionally defined, collected and analysed trips has often relegated care-related purposes to a residual role. These trips have often been categorized as "not compulsory", "non-work", "personal" and even "other" travel, and thus shadowed by trips conducted for occupational purposes (Boarnet & Hsu, 2015; Coutras, 1997; Sánchez de Madariaga, 2013). In addition, assessing mobility of care also requires providing a clear depiction of short walking trips that are also often dismissed in traditional household travel surveys. One of the reasons for this underestimation is that some surveys are designed to collect data only on long and motorized trips (Saelens et al., 2014). A second cause may be related to the fact that short walking trips (e.g., walking from home to store) are less likely to be reported, perhaps because they are less memorable, and thus more susceptible to recall bias, or because they are considered by the survey respondent as unimportant (Stopher et al., 2007). Lastly, care-related trips are often diluted in other trip motivations such as "visiting" or "leisure" (Carrasco, 2006; Sánchez de Madariaga, 2013; Sánchez de Madariaga & Zucchini, 2019). As these trips are not specifically collected under the scope of caring relationships, it is difficult to discern if there is an actual care purpose of the "visit" or what type of "leisure" activity is conducted at the destination. Thus, this is limiting our understanding of a crucial part of daily mobility that is commonly linked to female travel patterns.

8.3.2.3. Determinants of care-related trips

Although the "mobility of care" concept is rather recent, and despite its methodological constraints, a number of scholars mostly stemming from gender studies have examined different care-motivated trips (Boarnet & Hsu, 2015; Fan, 2017; Hanson, 1981; Lanzendorf, 2010; McDonald, 2005; Motte-Baumvol et al., 2011; Plyushteva & Schwanen, 2018; Rosenbloom, 1987; Scheiner, 2014; Scheiner & Holz-Rau, 2017; Schwanen, 2007; Taylor et al., 2015). Accordingly, they have also explored the factors or constraints associated with the total amount of such trips, their modal split, and their duration or distance travelled. Within these studies, three main determinants of care-related trips arise: individual, household, and territorial characteristics.

Among individual determinants, gender stands out as the most common key variable in previous studies. In different geographical contexts, previous evidence suggest that care-related trips are more frequently conducted by women, due to the gendered distribution of care-giving and household tasks, specifically evidenced by larger shares among women of trips related to errands or household tasks and daily shopping (Hanson & Hanson, 1991), and escorting children (Motte-Baumvol et al., 2017; Rosenbloom, 1987; Schwanen, 2007). Other individual characteristics that have been found significant include age, educational level or occupational status (Boarnet & Hsu, 2015; Motte-Baumvol et al., 2017; Scheiner, 2014; Waitt & Harada, 2016).

Household characteristics have also been found relevant for trips related to care, as they take into account the relational dimension of care, that is, the "caring for" others (Fan, 2017). Hence, household composition is frequently used as a proxy to measure the burden of care responsibilities. The presence of minors in the household is evidenced to act as daily travel time constrictor, decreasing the duration of trips (Delclòs-Alió & Miralles-Guasch, 2018). Another study observed how gender differences emerged, as women reported more child-and household-serving trips, regardless of the type of household they belong (i.e. male vs. women breadwinner households) (Taylor et al., 2015). The appearance of child is also associated with a major number of escorting trips (Handy, 1998; Plyushteva & Schwanen, 2018; Schwanen, 2007).

Lastly, there is also some evidence on the association between built environment characteristics and care-related travel patterns. More accessible, mixed, dense and compact environments are usually found to decrease gender differences in travel behaviour, as they provide shorter distances to everyday activities, including those related to care (Boarnet & Hsu, 2015; Miralles-Guasch et al., 2016; Motte-Baumvol et al., 2011). Others however, have argued that density alone is not always associated with a reduction of women care-travel burdens (McDonald, 2005) as the effects of territorial aspects on travel patterns are confounded with other factors such as household responsibilities, resources, perceptions or concerns (Clifton et al., 2005). We also found research that explored the differences in the care-related mobility between different urban types. One study suggested that rural and suburban areas require more chauffeuring from parents to support their children's activities (Tillberg Mattsson, 2002).

8.3.3. Methods

8.3.2.1. Study area

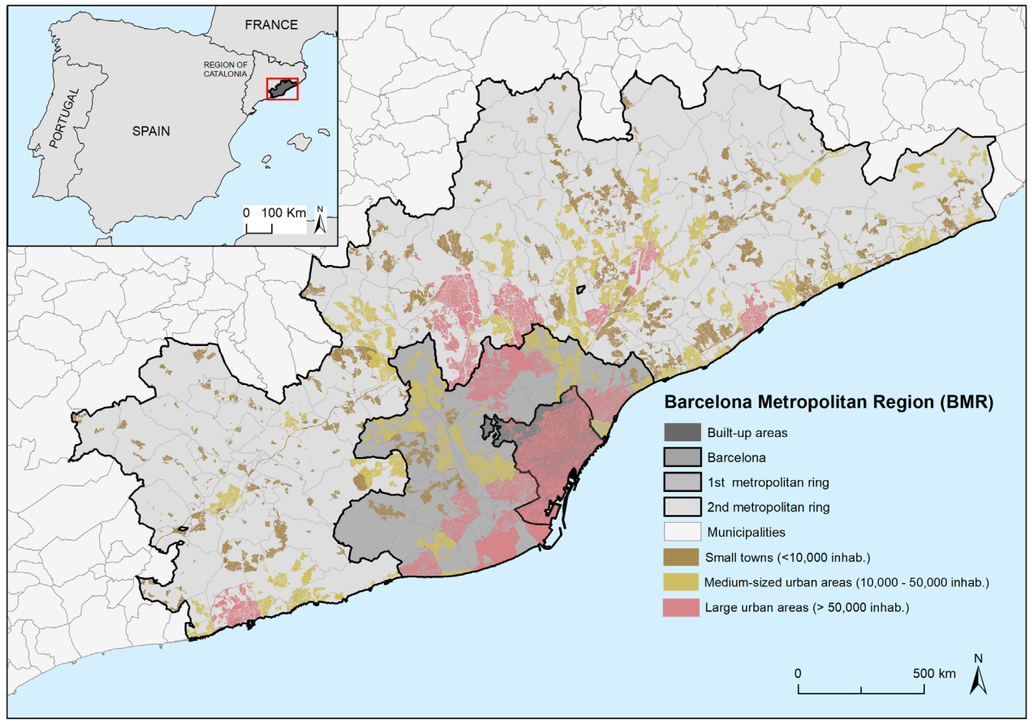
This study is set in the Barcelona Metropolitan Region (hereafter referred to as BMR) (Figure 27). Located in northeast Spain, the BMR is one of the major metropolitan areas in the Mediterranean. It gathers 5.2 million inhabitants, which represents a 10% of the Spanish population. The BMR spreads over an area of approximately 3,000 km2 and has a radius of 30-45 km. The BMR is structured in three main areas or rings. First, we find the municipality of Barcelona, which represents the core of the metropolitan region and accounts for approximately 1.5 million inhabitants. Second, we find an inner metropolitan ring that consists of a conurbation of 17 municipalities, mostly characterized by compact and high-density development. Third, we find an outer metropolitan ring that includes historical towns and medium-sized cities that present compact and dense features (Marmolejo and Stallbohm 2008), combined with areas of low density and sprawled suburban development (Font, 2007).

8.3.2.2. Data

The analysis of this study is based on data extracted from the Barcelona Metropolitan Region Workday Mobility Survey (or EMEF in its Catalan acronym, Enquesta de Mobilitat en Dia Feiner) (Institut d'Estudis Regionals i Metropolitans (IRMB), 2015). The EMEF is an official annual household travel survey based on computer assisted telephone interviews (CATI). Survey participants are asked to report all information regarding trips conducted in the previous workday (e.g., number of trips, trip purposes, transport modes, trip duration). The survey also collects individual and household characteristics, as well as perceptions and preferences over different transport modes. EMEF surveys the main data source for understanding travel behaviour in the BMR. In 2015, the EMEF collected data from a total of 9,490 individuals from

16 years old on. A relative error of ±1% was assumed, with a confidence level of 95.5%. We focused on individuals that reported at least one trip (Mobile population) and those that were not directly employed in the transport sector (e.g., bus or truck divers). Sample characteristics are presented in Table 12.

Figure 27. The Barcelona Metropolitan Region.



Source: own elaboration.

8.3.2.3. Definition of care-related trips

Since 2006, the EMEF includes a set of trip motivations related to the house maintenance, food provision, visiting and escorting others, personal arrangements and leisure activities. These trips are classified under the category of "personal mobility". Given the lack of consensus on a definition of mobility of care in order to operationalize care trips, we considered a wide notion of what "care" means, including trips based on the different interpretations mentioned in the theoretical framework. Thus, we selected a range of trip purposes included in the EMEF that are susceptible to be interpreted as a care activity, such as those referred to unpaid care labour (i.e. daily shopping, personal errands), including these activities related with an emotional tie (i.e. accompanying other individuals, visiting others), activities corresponding to basic needs (i.e. non-leisure eating, health-related), and finally, those recreational activities related to a "self-care" dimension (i.e. leisure, cultural events, sports, non-daily shopping…). The included trip purposes are summarized in Table 13. Indeed, within this umbrella term, we can identify different sub-groups of care-related trips: *daily shopping*, *accompany others*, *personal care*, and *recreational*.

Table 12. Sample description.

	Sample N	Population N[a]	%
Total	7,564	3,740,096	100
Individual characteristics			
Gender			
Men	3,697	1,828,279	48,9
Women	3,866	1,911,817	51,1
Age			
16-29	1,322	653,796	17,5
30-64	4,676	2,312,346	61,8
65 or more	1,565	773,953	20,7
Educational level			
No studies	225	111,032	3
Primary school	2,014	995,689	26,6
Secondary school	2,421	1,196,917	32
Superior studies	2,884	1,426,091	38,1
Occupational status			
Student	551	272,344	7,3
Employed	4,030	1,992,634	53,3
House tasks (unpaid household related work)	194	95,911	2,6
Unemployed	787	389,209	10,4
Retired	2,002	989,997	26,5
Household characteristics			
Number of minors in the household			
None	5,117	2,530,365	67,7
One	1,225	605,660	16,2
Two or more	1,222	604,070	16,2
Number of seniors in the household			
None	4,964	2,454,651	65,6
One	1,527	755,231	20,2
Two or more	1,072	530,214	14,2
Territorial characteristics			
Municipal population density (inhabitants/km^2)			
Low (<1,575)	1,533	757,859	20,3
Medium (1,576-9,425)	2,467	1,219,815	32,7
High (> 9,425)	3,538	1,749,553	46,9
Urban area type (per number of inhabitants)			
Small towns (<10,000)	442	218,705	5,8
Medium-sized urban areas (10,000 - 50,000)	1,683	832,093	22,2
Large urban areas (> 50,000)	5,438	2,689,298	71,9

[a]*Weighted by population weight.*

Table 13. Trip purposes included in Mobility of care.

Daily shopping	Personal care	Accompany others	Recreational
Daily shopping	Personal errands Eating (non-leisure) Health-related	Accompanying other individuals	Leisure Cultural events Cinema Restaurant Sports Visiting others Non-daily shopping

Source: own production.

8.3.2.4. Individual, household, and territorial characteristics

Individual characteristics correspond to gender, age, educational level, and occupational status. We also included two variables referred to the household structure. Based on what was found in previous literature, we have included the presence of minors (under 18 years old) and seniors (over 85 years old), which may be significant from a relational dimension of daily mobility (Delclòs-Alió & Miralles-Guasch, 2018a).

In order to understand differences from a territorial perspective, we used population density and type of urban area of participants' residences. Population density was calculated at the municipal level. Types of urban area correspond to the categorization of municipalities of BMR based on population size. We considered two criteria to define the thresholds. On the one hand, the official limit between rural and urban municipalities, established in Spain at 10,000 inhabitants (INE, 2001). On the other hand, a regional regulation that establishes urban transport as mandatory in municipalities over 50,000 inhabitants (Generalitat de Catalunya, 2003). As a result of these two thresholds, three urban type categories were included in the analysis: small towns (under 10.000 inhabitants), medium-sized urban areas (between 10.000 and 50.000 inhabitants), and large urban areas (over 50.000 inhabitants).

8.3.2.5. Analysis

The analysis is structured in two parts. First, we offer an overview of the magnitude of mobility of care in the BMR. We described the absolute and relative relevance of care-related trips in the context of overall daily mobility, considering *mobility of care* in general, how it compared to trips conducted to work and study, and examining care-related specific purposes (*daily shopping*, *accompanying others*, *personal care* and *recreational purposes*) (Table 14). We then examined the association between the number of care-related trips conducted per person and individual, household, and territorial characteristics, using a negative binomial regression. Coefficients from the negative binomial model were exponentiated and are interpretable as Incidence Rate Ratios (IRR) and 95% Confidence Intervals (CIs) (Table 15). A second step in the analysis was to examine the relationship between care-related trips and transport modes. We first explored the modal split by specific trip purposes and we a used Chi-square test to

identify possible bivariate associations (Table 16). We then performed a logistic regression to examine the association between the odds of care-related trips being conducted on active modes (walking or cycling), and individual, household, and territorial characteristics. We adjusted one model for all mobility of care trips, and one for each of the specific care-related trip purposes. Coefficients were also exponentiated and are interpretable as Odds Ratios (OR) and 95% Confidence Intervals (CIs) (Table 17). Analyses were conducted using IBM SPSS Statistics for Windows, Version 26.0 (Armonk, NY, USA).

8.3.4. Results

8.3.4.1. An overview of Mobility of care

Individuals residing in the BMR in 2015 conducted a total of 6,418,642 care-related trips on a typical weekday (Table 14). Mobility of care thus represents a 39.3% of all weekday mobility in the region (over 16 million daily trips), which is more than twice of commuting trips (*work or study*) (16.8%). Moreover, trips related to care are heterogeneously distributed in terms of specific trip purposes. An 8.8% of all weekday trips are conducted for daily shopping, a 5.8% for personal care, an 8.9% to *accompany others* and a 15.8% correspond to *recreational* trips.

Table 14. Weekday trips in the BMR, by purpose.

	Nª	%
Work or study	2,734,083	16,8
Mobility of care	6,418,642	39,3
Daily shopping	1,435,270	8,8
Personal care	947,105	5,8
Accompany others	1,451,905	8,9
Recreational	2,584,362	15,8
Return home	7,152,052	43,9
Total	16,307,382	100

a. Weighted to population level.

In Table 15 we report the IRR of care-related trips per person, both overall and for specific trip purposes. In terms of overall mobility of care (*Model 1*), we first observed that care-related trips were significantly more frequent among women (IRR 1.04, CI 1.01 to 1.09), and that they increased with age (IRR 1.03, CI 1.002 to 1.005). Education level and occupational status also showed significant associations with the number of care-related trips: individuals with higher education levels reported a higher number of trips related to care when compared to those with no studies (IRR 1.30 for those with superior studies, 1.27 for those with secondary school, and 1.10 for those with primary school), while students and employed individuals conducted less care-related trips compared to those unemployed or retired (IRR 0.43 and IRR 0.53, respectively). In terms of household characteristics, individuals with a higher number of minors in the household reported a significantly larger number of care-related trips (IRR 1.21, CI 1.18 to 1.25), while the number of seniors in the household showed a negative association with mobility of care levels (IRR 0.96, CI 0.93 to 0.99). Lastly, in terms of territorial characteristics, population density is negatively associated with the number of trips related to

Table 15. Incidence rate ratios (IRR) of individual weekday care-related trips associated with individual, household, and territorial characteristics, for overall mobility of care (Model 1) and for specific care-related trip purposes (Models 2 to 5) (N= 7,564).

	Model 1: Mobility of care (overall)	**Model 2: Daily shopping**	**Model 3: Personal care**	**Model 4: Accompany others**	**Model 5: Recreational**
	IRR (95% CI)	IRR (95% CI)	IRR (95% CI)	IRR (95% CI)	IRR (95% CI)
Individual characteristics					
Gender (ref=men)	1.05 (1.012, 1.09)*	1.14 (1.06, 1.24)*	1.12 (1.01, 1.24)*	1.25 (1.12, 1.39)*	0.90 (0.85, 0.96)*
Age	1.03 (1.02, 1.05)*	1.02 (1.01, 1.02)*	1.00 (1.00, 1.01)	1.01 (1.00, 1.01)*	1.00 (0.99, 1.00)*
Educational level (ref=no studies)					
Primary school	1.10 (1.00, 1.22)*	1.33 (1.10, 1.62)*	1.01 (0.77, 1.32)	1.45 (0.87, 2.43)	1.00 (0.86, 1.16)
Secondary school	1.27 (1.15, 1.40)*	1.48 (1.21, 1.80)*	1.14 (0.87, 1.50)	1.86 (1.11, 3.11)*	1.07 (0.91, 1.24)
Superior studies	1.30 (1.18, 1.44)*	1.64 (1.34, 2.00)*	1.36 (1.03, 1.78)*	1.68 (1.00, 2.80)	1.04 (0.89, 1.21)
Occup. status (ref= unemployed or retired)					
Student	0.43 (0.38, 0.48)*	0.30 (0.22, 0.42)*	0.50 (0.37, 0.68)*	0.06 (0.03, 0.12)*	0.70 (0.61, 0.81)*
House tasks (unpaid household related work)	1.00 (0.38, 0.48)	1.41 (1.22, 1.63)*	0.87 (0.66, 1.15)	0.99 (0.72, 1.35)	0.84 (0.69, 1.01)
Employed	0.53 (0.50, 0.56)*	0.57 (0.51, 0.62)*	0.51 (0.45, 0.59)*	0.54 (0.47, 0.61)*	0.53 (0.49, 0.57)*
Household characteristics					
Minors in the household	1.21 (1.18, 1.25)*	1.00 (0.95,1.06)	0.91 (0.84, 0.99)*	2.65 (2.49, 2.82)*	0.80 (0.76, 0.84)*
Seniors in the household	0.96 (0.93, 0.99)*	0.93 (0.87, 0.99)*	0.96 (0.88, 1.05)	0.92 (0.82, 1.04)	1.01 (0.96, 1.06)
Territorial characteristics					
Population density[1] (pop/sq.km)	0.99 (0.991, 0.998)*	0.99 (0.99, 1.00)*	1.01 (1.00, 1.01)	0.98 (0.97, 0.99)*	1.00 (1.00, 1.01)
Urban type (ref= small towns)					
Medium-sized urban areas	1.08 (0.98, 1.19)	1.10 (0.92, 1.32)	1.03 (0.82, 1.30)	1.06 (0.83, 1.36)	1.08 (0.94, 1.24)
Large urban areas	1.07 (0.97, 1.17)	1.07 (0.90, 1.28)	1.02 (0.81, 1.29)	1.16 (0.91, 1.48)	1.01 (0.88, 1.15)

*$p < 0.05$.

care in the BMR (IRR 0.99, CI 0.991 to 0.993).

Moreover, we observe significant differences in these associations when we focus on specific care-related trip purposes (*Models 2 to 5*). We found key individual variables that consistently showed significant associations with the different types of care-related trips. For example, women significantly reported more trips for *daily shopping*, *personal care* and to *accompany others* (IRR 1.14, IRR 1.12 and IRR 1.25, respectively), while they reported a significantly lower number of recreational trips compared to men (IRR 0.90). Age was significantly associated with an increase of *daily shopping*, *recreational*, *accompany others* and *recreational trips* (IRR 1.02, 1.00, 1.01 and 1.00, respectively). In terms of educational level, higher level of studies indicates greater number of trips of *daily shopping* (IRR 1.33 for those with primary school, 1.48 for those with secondary school, and 1.64 for those with superior studies). Occupational status presented differences in all types of care-related trips, showing how students and employed people had significantly lower number of trips (IRR 0.43 and IRR 0.53, respectively) compared to retired people. More specifically, students reported significantly lower numbers of trips for *daily shopping* and *accompany others* (IRR 0.30 and IRR 0.06, respectively) compared with recreational trips (IRR 0.70). We also found a positive association of house task occupational status with more trips for *daily shopping* (IRR 1.41).

Household characteristics also showed significant associations with the number of specific care-related trips. The presence of minors in the household was associated with less trips for personal care (IRR 0.91) and *recreational* purposes (IRR 0.80), and with more trips to accompany others (IRR 2.65). By contrast, the presence of seniors was only associated with a lower number of trips for *daily shopping* (IRR 0.93). Finally, among the significant associations with territorial characteristics, we found that density is associated with a low number of trips for daily shopping and *accompanying others* (IRR 0.99 and 0.98, respectively).

8.3.4.2. Modal split mobility of care

Approximately half of all weekday trips in the BMR in 2015 were conducted on active means of transport (cycling or walking) (49.0%), followed by private transport (32.5%) and public transport (18.5%) (Table 16). Moreover, the use of active mobility was significantly higher for care-related trips compared to work or study trips (61.0% vs 20.8%). By looking at specific care-related trip purposes, the use of active modes were especially high for *daily shopping* trips (80.7%) and, to a lesser extent, for *recreational trips* (61.9%). Conversely, the use of public transport was significantly more common for trips related to *personal care* (25.4%), and private transport was significantly more frequently used for trips conducted to *accompany other people* (42.8%).

In Table 17 we report the Odds Ratios (OR) of care-related trips being conducted in active modes of transport. In terms of overall mobility (Model 7), we found certain individual characteristics that have a significant association with active trips. Age makes more likely to conduct a care-related trip with an active mode (OR 1.00, CI 1.00 to 1.00), while the chances decline with the increase of educational level (OR 0.94 for those with primary school, 0.88 for those with superior studies). Regarding occupational status, we identified that trips conducted by employed people are less likely to be performed by an active mode (OR 0.88, CI 0.77 to 0.87) compared with those unemployed, retired and in charge of house tasks (OR=1.09, CI 1.02 to 1.16). Moreover, we also found out significantly association with territorial characteristics. Higher density of population contributes to a more probability to choose an active mode for care-relate trips (OR 1.01, 95% CI 1.00 to 1.01). And, in terms of urban type, trips conducted

for mobility of care are more likely to be active in medium-sized and large-urban areas (OR 1.25 and 1.27, respectively) than in small towns.

Table 16. Modal split of weekday trips in the BMR, by purpose.

	n	Active (%)	Public transport (%)	Private transport (%)	Total (%)
Work or study	2,734,083	20.8*	32.7**	46.5**	100
Mobility of care	6,418,642	61.0**	12.5*	26.5*	100
Daily shopping	1,435,269	80.7**	4.9*	14.4*	100
Personal care	947,105	47.1*	25.4**	27.5*	100
Accompany others	1,451,906	48,9	8.3*	42.8**	100
Recreational	2,584,362	61.9**	14.4*	23.7*	100
Return home	7,152,052	49.6**	18.8**	31.6*	100
Total	18,509	49	18,5	32,5	100

Test: Chi2 sig=000 all categories; adjusted residuals test, corrected.

*** significantly higher values*

** Significantly lower values*

It is also interesting to note at the significant associations for the specific care-purposes (*Models 8 to 11*). Starting with individual characteristics, trips to *accompany others* are more likely to be active when they are made by women (OR 1.12). By contrast, they are less likely to be active when they are conducted by employed people (OR 0.78) compared to unemployed and retired, and with superior studies (OR 0.60) compared with secondary or primary school educational levels (OR 0.62 and 0.67, respectively). For accompanying others purpose, we also identified significant association with household characteristics. Trips made by people with minors in the household are more likely to be conducted by an active mode (OR 1.17). The presence of seniors also presents a negative significant association with active trips for *daily shopping* purpose (OR 0.96). In terms of territorial characteristics, trips for *personal care*, *accompanying others*, and *recreational* purposes have more chances to be conducted in an active mode in medium-sized (OR 1.54, OR 1.46 and OR 1.19, respectively) and large urban areas (OR 1.55, OR 1.59 and OR 1.18, respectively).

8.3.5. Discussion and conclusions

In this study we examined what care-related trips represent in the context of everyday mobility, what sociospatial factors are associated with such trips, and what is the use of different transport modes in a Mediterranean urban setting. Our results showed that mobility of care is a central component of everyday mobility in the Barcelona Metropolitan Region, and that is mostly conducted on active modes. Care-related travel patterns vary significantly according to individual, household, and territorial characteristics. Mobility of care is more frequent among women, increases with age and with the presence of dependent individuals in the household, especially with minors. Additionally, denser and larger urban areas are more likely to facilitate the use of active modes for care-related trips. Lastly, our results indicate that to fully examine mobility of care, such trips cannot be considered as part of a homogeneous category, but instead care-related specific purposes need to be accounted for and interpreted.

Table 17. Odds Ratios (OR) of weekday care-related trips being conducted in active modes, associated with individual, household, and residential characteristics, for overall mobility of care (Model 7) and for specific care-related trip purposes (Models 8 to 11).

	Model 7: All care-related trips (N=14,894)	Model 8: Daily shopping trips (N=3,344)	Model 9: Personal care trips (N= 2,124)	Model 10: Trips to accompany others (N=3,462)	Model 11: Recreational trips (N=5,964)
Individual characteristics					
Gender (ref=male)	1.02 (0.99, 1.05)	0.994 (0.95, 1.03)	1.09 (0.98, 1.20)	1.12 (1.03, 1.21)*	0.97 (0.93, 1.02)
Age	1.00 (1.00, 1.00)*	1.00 (1.00, 1.01)*	1.01 (0.99, 1.00)	0.99 (0.99, 1.13)	1.04 (1.02, 1.06)*
Educational level (ref=no studies)					
Primary school	0.94 (0.88, 0.99)*	0.94 (0.88, 0.99)*	1.00 (0.73, 1.18)	0.72 (0.57, 0.93)*	0.94 (0.87, 1.02)
Secondary school	0.86 (0.81, 0.92)	0.94 (0.87, 1.00)	0.93 (0.73, 1.18)	0.67 (0.52, 0.87)*	0.82 (0.76, 0.90)*
Superior studies	0.82 (0.77, 0.87)*	0.88 (0.82, 0.95)*	0.84 (0.66, 1.07)	0.60 (0.47, 0.79)*	0.79 (0.73, 0.86)*
Occupational status (ref= unemployed or retired)					
Student	0.97 (0.89, 1.06)	0.99 (0.85, 1.17)	0.98 (0.73, 1.30)	0.66 (0.42, 1.03)	0.99 (0.99, 1.12)
House tasks (unpaid household related work)	1.09 (1.02, 1.16)*	0.99 (0.92, 1.08)	1.34 (1.10, 1.64)*	1.10 (0.94, 1.29)	1.02 (0.90, 1.15)
Employed	0.88 (0.84, 0.91)*	0.92 (0.87, 0.96)*	1.01 (0.89, 1.14)	0.78 (0.72, 0.85)*	0.86 (0.81, 0.91)*
Household characteristics					
N of minors in the household	1.00 (0.98, 1.02)	0.98 (0.95, 1.02)	0.99 (0.93, 1.07)	1.17 (1.12, 1.23)*	0.98 (0.94, 1.02)
N of seniors in the household	0.99 (0.97, 1.01)	0.96 (0.94, 0.99)*	0.99 (0.92, 1.07)	1.04 (0.95, 1.13)	1.01 (0.96, 1.03)
Territorial characteristics					
Population density (1km pop/ sq.km)	1.01 (1.00, 1.01)*	1.01 (1.00, 1.01)*	0.99 (0.98, 1.00)	1.014 (1.00, 1.02)*	1.02 (0.99, 1.00)
Urban type (ref= small towns)					
Medium-sized urban areas	1.25 (1.15, 1.36)*	1.08 (0.96, 1.20)	1.54 (1.12, 2.11)*	1.46 (1.13, 1.88)*	1.19 (1.05, 1.35)*
Large urban areas	1.27 (1.17, 1.38)*	1.10 (0.97, 1.24)	1.55 (1.13, 2.14)*	1.59 (1.23, 2.04)*	1.18 (1.04, 1.33)*

*$p < 0.05$.

Mobility of care accounts for approximately 40% of all trips conducted on a weekday, surpassed only be trips conducted to return home. These results are in line with previous evidence (Ravensbergen et al., 2022; Sánchez de Madariaga & Zucchini, 2020), which confirms the need to understand care-related trips as an essential part of everyday life. Additionally, this study sheds light on the determinants of care-related travel patterns. Regarding individual characteristics, we observed how gender still plays a significant role in the number of care-related trips conducted daily. Consistent with previous research (Motte-Baumvol et al., 2017), we identified a gender gap for specific care purposes. Women, as the main caregivers, still report more trips related with house maintenance tasks such as daily shopping and relational care such as accompanying other individuals. Men, however, report a higher rate of trips related to what can be considered as self-care activities, which in this study mainly refers to recreational purposes (Boarnet & Hsu, 2015). We also observed that age and higher educational attainment were associated with a higher number of care-related trips. The higher number of care-related trips associated with elder is related to the experiential significance of mobility (Croucher et al., 2020). For example, in the case of *daily shopping*, in Spain, for seniors, may be seen beyond the provision of basic needs, but as a source of social interaction and physical activity (Díez, Valiente, et al., 2017). In terms of occupational status, results also showed that the number of daily care trips is lower for those who required commuting (students and employed people), compared to those who do not do mandatory commuting (unemployed and retired).

With respect to household characteristics, our results suggest that the presence of dependent individuals seems to increase mobility of care for household members, with significant differences related to seniors and minors. A larger presence of seniors has a positive association with the number of *daily shopping* trips. Research on local food environments conducted by Díez et al. (2017, 2018) found that older adults appreciate buying in specialized stores rather than other retail types such as supermarkets or malls, which is translated in a higher number of trips to meet their shopping needs. On the other hand, the presence of minors has an impact on trips to *accompany others*, duplicating the number of trips for this purpose. This specific result could be explained by social practices that are built upon the culture of parenting, which involves escorting children to school and to other places (Barker, 2011).

Regarding residential characteristics, higher density showed a negative association with the number of care trips, especially those for *accompanying others*. The greater availability of services and public transport options derived from higher levels of urban compacity allows for higher degrees of individual autonomy (Marquet & Miralles-Guasch, 2015), which in turn makes escorting trips less necessary.

Our results clearly confirm the link between mobility of care and the use of active modes of transport, evidenced by the fact that 60% of care-related trips in the BMR were conducted either on foot or by bike, contrasting with a north-American context, where mobility of care is mainly motorized (Ravensbergen et al., 2022). As a reference, the share of active modes in daily commuting trips in the Barcelona metropolitan area is only around 20% (Autoritat Transport Metropolità, 2019). This evidences that care-related trips mostly take place at the proximity scale, implying short walking trips (Marquet & Miralles-Guasch, 2015). This has both environmental and social implications. From an environmental perspective, mobility of care is clearly associated with a more sustainable travel pattern. Hence, cities that allow for greater degrees of proximity-based mobility would at the same time facilitate trips derived from care-related activities. From a social perspective, the benefits of such mobility are clear in terms of health, social equity, and inclusiveness. Active transport is one of the sources of our daily physical activity, which is considered as essential to maintaining physical and mental health (Ewing et al., 2014). Lastly, walking in particular can be regarded as the most democratic mode of transport, since it grants almost universal accessibility given its low number of barriers of use (Lucas, 2012).

Despite of this general trend, particular attention needs to be paid to the significant differences observed in the modal split across sociodemographic groups, and regarding specific care-related purposes: while almost all *daily shopping* trips were conducted in active modes (80.7%), for trips to *accompany others* the proportion was significatively lower (48.9%). By contrast, such trips presented a greater share of private transport (42.8%) compared to those for *daily shopping* (14.4%). As suggested by previous literature (Mattioli et al., 2016; McDonald, 2005) such significant differences could be explained by the ability to carry objects or other people (mostly dependent individuals) by means of private vehicles. This "cargo-function" of the car in the BMR seems clear for trips to *accompany others*, but not for *daily shopping*. This is probably related with the dense and mixed used structure of Mediterranean cities, which allows to conduct most daily shopping within the neighborhood and at a walkable distance from home (Díez et al., 2018; X. Garcia et al., 2020; Marquet & Miralles-Guasch, 2014).

Individual, household, and territorial constraints also showed significant differences in terms of the modal split of mobility of care. While previous literature had found an association between active modes and gender (Miralles-Guasch et al., 2016; Scheiner & Holz-Rau, 2017), we did not find such associated specifically among care-related trips. This has relevant implications, as it would suggest that gendered mobility differences are explained by the different typologies of trips on which each gender group engages more often. In our study we only found gender-related differences in terms of trips to accompany others. Consistent to previous research, age was observed to be associated with more chances to conduct care trips on active modes while higher educational level decreases the probability (Ko et al., 2019). In terms of occupational status, employed people is less likely to conduct care-trips with active modes. This could be explained by time constraints. Larger commutes reduce travel time budgets, causing a more frequent use of public and private transport to access all necessary daily activities (Vande Walle & Steenberghen, 2006).

The presence of minors in the household also resulted in significant increases in the number of active care-related trips. This association contrasts with previous evidence where children are often related to driving due to time pressure, which explains a higher use of car as main transport mode (Dowling, 2000; Maciejewska & Miralles-Guasch, 2019; Motte-Baumvol et al., 2011). Instead, we observe an increase of active trips that may be explained by the relevance of the so-called "third places" (Oldenburg & Brisset, 1982) for minors. These are safe outdoor spaces (e.g., parks, squares or streets per se) different from delimited first and second places (home and school, respectively), where children can be physically active, socially interactive and independently mobile (Carroll et al., 2015). These third places, commonly situated nearby the residence, act as restrainers of daily mobility, thus, giving more relevance to proximity walking trips.

Finally, regarding territorial characteristics, density and city size are also associated with a larger relevance of active trips. These results that have been repeatedly validated in prior literature that examines the relationship between built environment with either walking for transport or overall physical activity, pointing at density, diversity, and accessibility as driving factors of such activities (M. Smith et al., 2017).

All in all, this paper contributes to travel behavior studies mainly in two ways. Firstly, it sheds

light to the relevance of care-related trips in the context of daily mobility. The "power of naming", that is, of conceptualizing a daily reality (R. Law, 1999), helps to avoid viewing care as a marginal issue, and instead, opens the opportunity to place care in the heart of urban transport analysis and policies. Consequently, it creates the possibility to challenge the hegemonic male-oriented planning tradition of mobility systems, which have structured transport for the good of productive sphere, focused into commuting (Valdivia, 2018). Secondly, by both quantifying mobility of care as a whole and examining specific care purposes we aim to offer a better understanding of the care-related mobilities that may inform urban policies aiming to support care-related trips. In a general level, by promoting compact and mixed urban environments where daily needs can be satisfied in the short-range scale, as recently highlighted by current planning initiatives such as the 15-minute city paradigm (Moreno et al., 2021). In addition, these results could also inform specific transport strategies such as public policies aimed at accompanying others, for example those aimed at improving safety in trips to school. These transformations would be expected to have a positive impact also in terms of gender equity, as they promote a more equitable distribution of caring tasks at the household level (Lo & Houston, 2018), while at the same time contributing to transition towards a more sustainable transport system (Kronsell et al., 2016).

Our study is not without limitations that can inform future studies on the topic. The survey data used in this paper was not specifically gathered with a focus on care-related activities, thus, having several implications. First, inaccuracies in the self-reporting of care-trips are to be assumed, particularly in purpose categories such as "visiting others" or "recreational" trips, where it is uncertain if the activity had a clear care-implication. Secondly, the categories inaccuracy has implications in a theoretical sense, as we had to consider a wide notion of "care" for operationalizing mobility of care, while other authors argue a more restrictive definition. Finally, this lack of a care-sensitive perspective in the survey design is translated in a range of missing variables that would have been interesting to consider when analyzing mobility of care. It would be interesting to have information regarding the relational care networks of the individuals, such as whether respondents are responsible for dependent individuals or have access to external assistance for carrying out caregiving tasks (e.g., a family member, an assistance service, a paid caregiver). And also, it would be relevant to gather additional information on trip purposes, about companions, carried objects or trip chaining. This is an important issue not only for future studies but also for transit agencies and should be considered in future research on mobility of care also from qualitative perspectives.

We expect this study to contribute to understanding how care operates through everyday mobility, by accounting for care-related trips and exploring their relationship with a set of key sociospatial factors. The findings provided in this study can serve as insights for future studies that aim to expand the understanding of what mobility of care consists of what unequal social relationships it is related to, which can inform public policies that work to advance towards more inclusive and caring cities.

Capítulo 9

Operativización cuantitativa y espacial de la vitalidad urbana

9.1. Youth Perception of Urban Vitality: A PhotoVoice Study on the Everyday Experiences of Public Space

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Youth Perception of Urban Vitality: A PhotoVoice Study on the Everyday Experiences of Public Space

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Abstract
Promoting urban vitality has become an increasingly important focus among urban planners in the last decade. However, most definitions about what urban vitality consists of are based on quantitative methods, while the meaning and implications of vitality also need to be understood qualitatively. We conducted a study based on the PhotoVoice method in a low-income district in Barcelona, Spain, to explore how vitality is constructed among young people, a traditionally underrepresented group within the urban discussion and decision-making. The method, based on photography and group discussion, has proven effective to incorporate subjective perceptions and everyday life experiences on the understanding of the elements that contribute to urban vitality.

Keywords
PhotoVoice, youth, subjective vitality, public space, low-income district, Barcelona

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9.1.1. Introduction

Cities should be thought of as more than solely places in which we simply live, but rather as livable urban spaces that sustain life (Arundel et al., 2017). There is a need to design cities that take care of people (Power & Williams, 2019), and can support their basic daily activities while promoting quality of life. Public spaces play an important role in this regard, especially for young people as they are frequent users and these spaces provide them with opportunities for physical activity, social interaction, and personal development (Szczepańska & Pietrzyka, 2021). The built environment has a significant impact on everyday well-being, and the COVID-19 pandemic has brought greater attention to the role of proximity environments in cities in promoting health and wellness (Global Mayors COVID-19 Recovery Task Force, 2020; Springer, 2020).

The concept of urban vitality has undergone significant development over the years and is now recognized as a crucial indicator of good quality of life, as evidenced by numerous studies that have measure its impact on various aspects such as health, safety, sustainability, and well-being. The literature on urban vitality largely relies on a quantitative approach and has been mostly conducted using a large-scale city analysis. These contributions, although valuable, have often overlooked people's perceptions and real-life experiences and have often failed to consider the unique characteristics of specific socioeconomic contexts, such as vulnerable areas. Moreover, the literature has neglected to acknowledge the different meanings that vitality can hold for different sociodemographic groups, such as young people. In light of these limitations, there is a need for a more qualitative, experiential analysis of urban vitality that considers how the built environment supports daily life, community life, care, and well-being for the young. To achieve this, this study launched a PhotoVoice project in a low-income district of Barcelona that involves young people. The goal of this project is to explore the components that contribute to neighborhood vitality from the perspectives and experiences of young people ranging from 15 and 22 years old, providing a more nuanced understanding of urban vitality in this context.

9.1.2. Previous research on the concept of urban vitality

Creating thriving neighborhoods that can foster strong local networks for wellbeing , has been a priority for urban planners in the last decade. Since the times of urban theorist Jane Jacobs (1961), planners have acknowledged the capacity of specific urban attributes to create life in the street; or, on the contrary, to lead to their decay or death (Jacobs, 1961). Jacobs defined urban vitality as the quality of vibrant urban spaces that are able to gather diverse types of people and activities at different times of the day, thanks to their intense community life. Jacobs' approach emphasized the value of individual and collective experiences in utilizing the street as a source of knowledge for understanding the city (Sassen, 2016). Most notably, she shifted the focus of urban analysis to a proximity scale, considering the micro-elements of the built environment and the interaction between people and places within the context of daily life.

Jacobs' ideas are at the root of a large tradition of studying urban vitality, and the foundation of many modern urban planning theories promoting human-scale cities with pedestrian-oriented designs, and diverse and mixed-use neighborhoods. In this sense, new concepts such as "urban intensity" (Guan & Rowe, 2016) or "open city" (Sennett, 2018) have appeared in recent years to similarly refer to compact, dense, diverse, safe and well-connected public spaces within a city.

However, the ideas of a people-centered urban design have been globally popularized by the well-known applied work of Jan Gehl in different cities around the world. His approach of creating "lively", comfortable, and safe cities advocates for designing public spaces that maximize diverse social exchange, creating environments chances to meet other people either accidentally or intentionally are high (Gehl, 2010). The urban vitality concept has thus evolved and been updated repeatedly in recent years, however, the central ideas of Jane Jacobs regarding the meaning of urban vitality and the necessary elements for its creation remain at the core of these reinterpretations.

Within the majority research line using quantitative approaches to measure objective conditions for vitality, a considerable body of literature has attempted to measure vitality by relating it with different types of data, such as mobility flows (De Nadai et al., 2016; C. Kang et al., 2020; Lunecke & Mora, 2018; Marquet & Miralles-Guasch, 2016; Sulis et al., 2018), crime rates (Humphrey et al., 2017; Shach-Pinsly, 2019), accessibility to green spaces (M. N. Lopes & Camanho, 2013), access to wi-fi hotspots (Y. L. Kim, 2018), points of interests from social media data (Lu et al., 2019), commercial network (Yoon & Park, 2018), or health outcomes (Braun & Malizia, 2015). Other authors have focused on creating synthetic indexes that encapsulate the built environment determinants of urban vitality (Delclòs-Alió & Miralles-Guasch, 2018b; Gómez-Varo et al., 2022; Q. He et al., 2018; H. G. Sung et al., 2013; Zeng et al., 2018). The extensive research on the topic recognizes that urban vitality requires a number of built environment attributes. Among them, there is the need for (1) a concentration of people and activities in the public space so that an informal surveillance system is created by the presence of eyes on the street; (2) diversity of activities -land use mix-; (3) people diversity through social mixture, something that often results from the presence of diverse typologies of buildings; and (4) environments designed at the human scale, with contact opportunity and accessibility.

9.1.3. The Need for New Approaches, Contexts, and Social Groups to Assess Urban Vitality

According to Maas (1984), urban vitality contains a substantial experiential element. Hence, an integrative approach that considers the significance of places, as emphasized by Sternberg (2000), can result in a more comprehensive analysis. Originally, Jacobs' approach to urban vitality was eminently qualitative, shifting the focus from a macro-scaled city analysis of the contemporary planning orthodoxia to a micro-scaled analysis of neighborhoods and their streets, based on everyday life experiences and observations. Considering this approach, it is essential to understand how urban features support local people's daily activities, community life, care, and well-being.

Most existing studies in the urban vitality field have evaluated vitality at the large-city scale with no detailed investigation in more specific urban environments, especially those presenting unfavorable socioeconomic indicators (Gómez-Varo et al., 2022). Research on the urban vitality of vulnerable areas to date is, to our knowledge, scarce. Only a handful of studies have analyzed how built environment features promoting urban vitality are linked to increased social capital, benefiting community ties and social cohesion, accessibility, and health outcomes, among others (Leyden, 2003; Mazumdar et al., 2018).

Similarly, these quantitative studies do not distinguish on the body of urban vitality literature

and tends to not disaggregate among sociodemographic groups, perpetuating the biased idea that all population groups react and are affected equally by the urban vitality potential of the built environment. There is a need to understand the perceptions and experiences of those vulnerable social groups, such as young people, that have been historically underrepresented and stigmatized from urban discussion and decision-making, (Bridgman, 2004).

9.1.4. The PhotoVoice method

In order to understand how the built environment features dialogue with people's perception of what vitality is and their real daily life activities, we launched a PhotoVoice project involving young people in a peripheral low-income district of Barcelona, Spain. The participatory and qualitative nature of the PhotoVoice method makes it perfect for understanding vitality using a Jacobsian approach by focusing on everyday life experiences explained from locals' perspectives.

PhotoVoice, also known as Photo Elicitation, is a Participatory Action Research method that engages participants using images (Photo) and group discussions (Voice) to document and reflect upon their own realities (C. Wang & Ann Burris, 1997). It draws on the theoretical principles of the pedagogue Paulo Freire (Freire, 1970, 1973), and is based on the idea that people themselves are the experts regarding their own lives, and they learn from each other through critical dialogue. PhotoVoice incorporates these ideas by asking participants to first take pictures of their insights, and then share them with others in group discussions explaining the meanings and the stories behind the photographs, and collectively identifying community needs (Coemans et al., 2019).

The PhotoVoice technique is also rooted in a feminist approach and has served as a research tool to empower women and other marginalized voices from vulnerable population groups, often neglected regarding the production of knowledge (Kornbluh et al., 2015). Thus, photovoice challenges mainstream research traditions by recognizing a plurality of subjects in knowledge production and brings people to work together in a mutual concern to address the traditional unequal distribution of power between researchers and the researched (McTaggart, 1999). This implies to adapt the method to be appropriate within the specific workgroup. For example, by replacing the classic research methods, such as surveys or semi-structured interviews, for the so-called "visual research methods", which use visual materials to explore research questions (Rose, 2014). Thus, they allow to easily grasp daily life experiences in a way that could be more difficult to reach with other methods.

In this sense, this methodology has been recently relevant when working with young people (Balvanz et al., 2016; Derr & Simons, 2020; Hemy & Meshulam, 2021), because in the context of an increasing importance of visual images in social and cultural practices, the young population are very familiar with the daily practice of image sharing on social media (Volpe, 2019).

PhotoVoice methods are particularly suited for the analysis of experiences that take place in the urban setting. As such, it has been used to explore the daily experiences and subjective meanings related to places at the individual and community levels (Erfani, 2021). These methods have recently been used to provide a deeper understanding of the links between the built environment and physical activity (Gullón et al., 2019), mental health (Mysyuk & Huisman, 2018); or more specifically, the impact of food environments on diet (Gravina et al., 2020; Rosado et al., 2020; Shannon et al., 2020). PhotoVoice methods have also been used to test the effect of residential insecurity (ASPB & Hipoteca, 2018), tourism gentrification (Sánchez-Ledesma et al., 2020), urban vacant properties (Sampson et al., 2017), or even urban redevelopment processes (Guinand et al., 2021; Lim et al., 2021).

9.1.5. Materials and methods

This PhotoVoice project was conducted from November to December 2021, as part of the project "*PhotoVoice: in search of vital spaces in Nou Barris District*", funded by the Barcelona City Council, which sought to understand which urban features and spaces contribute to urban vitality.

9.1.5.1. Study Setting

The study area covered the Nou Barris District (Figure 28), located on the northeast side of Barcelona, and divided into 13 neighborhoods. Nou Barris has a unique morphology and socioeconomic characteristics. The district presents steep slopes due to its geographical situation bordering *Collserola* hill (with a maximum height of 500m). It followed a layered development history, initially stemming from an urban core within a rural area, and then growing exponentially by migratory waves of working-class population that looked to settle on the outskirts of the city in the second half of the twentieth century (García Soler, 1998). As a result of this process, we identify 5 kinds of urban fabrics (Figure 28): a) historical centers; b) orthogonal streets pattern, c) high-rise buildings, d) low-rise houses, and e) informal and sprawled settlements of self-construction houses. The district can be generally regarded as a district of low socioeconomic status (Antón-Alonso & Porcel, 2021), with an average household income per capita of 15,924 €, which is significantly below the city average of 21,484 € (Ajuntament de Barcelona, 2021b). At the same time, Nou Barris District has an established tradition of social cohesion and participation (García et al., 2015).

9.1.5.2. Participant recruitment

The PhotoVoice process has been summarized in Figure 29. First, we recruited participants mainly by involving one of the key social actors of the district in the project, the Youth Civic Center of Roquetes (in the Catalan language, the *Kasal de Joves* de Roquetes, later reduced to *Kasal*), a youth center self-managed by an association formed by volunteers. The *Kasal* was first contacted by email and later we organized an in-person meeting where we explained the project in detail. Staff members of the *Kasal* facilitated participants' recruitment by informing other members and young people that participated into *Kasal* activities. All eligible participants had to meet the following requirements: 1) being between 15 to 24 years old (according to United Nations, the age range that comprises youth), 2) live in the district; 3) speak Catalan or Spanish, 4) agree to attend at least five group sessions, and 5) agree to engage in the project. Following recommendations on the ideal size of photovoice groups by Wang (1999) and Díez et al. (2017), the final composition of the group was set at 7 participants. The group was composed of five females and two males, aged between 15 and 22 years, who lived in different neighborhoods of Nou Barris District, and with a low socioeconomic profile. All had already participated in *Kasal* activites, two for more than three years, while the other five were more recently incorporated during the last two years. Upon completion of the project, we also provided each participant with a personal portrait taken by a professional photographer, and *Kasal* with a gift voucher to spend on material resources for video recording and display.

Co-facilitators in the group sessions were two researchers and one social worker. These were

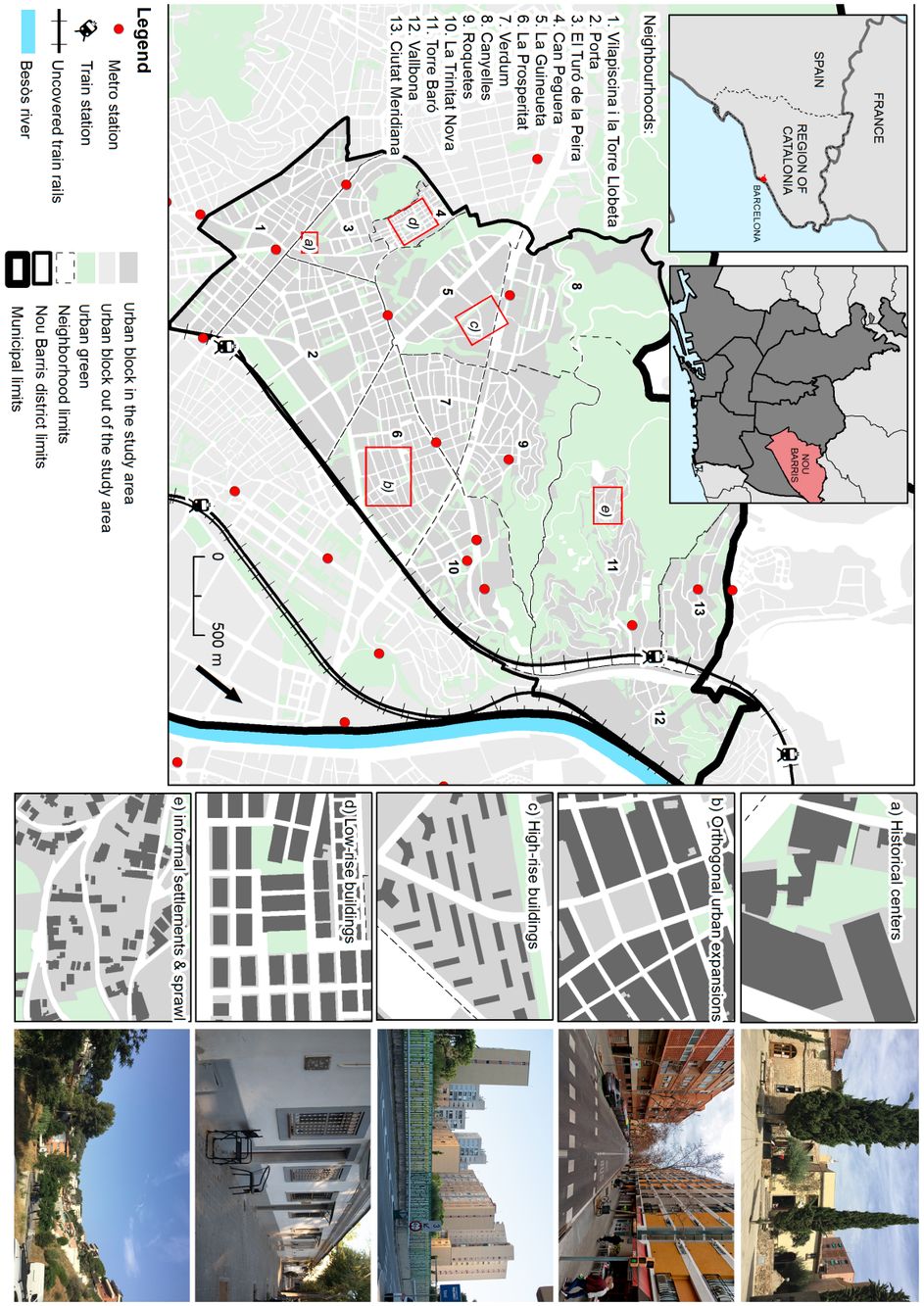


Figure 28. Geographical context: Nou Barris District in Barcelona.

Source: own elaboration.

Figure 29. Summary of the PhotoVoice project steps and images of the process.

Source: own elaboration.

carefully selected, as their social positions and roles are relevant in terms of power relations (Davis et al., 2020), and thus all had a young profile and considerable previous experience in participatory youth associations.

9.1.5.3. Photovoice procedure – group sessions and analysis

The PhotoVoice process consisted of 5 group sessions (Figure 29). Before we had a preliminary meeting with the participants, where we had a first contact, gave an introduction to the project aims and activities, and discussed the group sessions schedule. PhotoVoice is a time-demanding research methodology in which participants invest their time voluntarily. Because of that, we followed the recommendation to agree on the meeting schedule and dates with participants in accordance with their availability (Sutton-Brown, 2014). While other PhotoVoice studies take up more time, considering the age of our participants, and that all of them were in the student stage, we designed a shorter PhotoVoice process. We also settled on *Kasal* as a meeting location, so that we used a familiar space for participants that they could reach easily.

The traditional PhotoVoice methodology was adapted to include the increasing use of mobile smartphones in the everyday lives of young people (Volpe, 2019). Hence, we used a WhatsApp™ group to communicate among us. We also offered participants to be provided with a digital camera, but they all preferred to use their own smartphone camera, as it felt more natural.

Prior to the group sessions, informed consent was obtained and permission for recording was given by all participants. In the case of minors, parents were asked to sign the consent form as their responsible tutors. All materials relating to the process can be found elsewhere (GEMOTT, 2022).

In Session 1, we started with ice-breaking games which used photographic materials to generate a confident working atmosphere among all the people involved in the project. Then, participants took part in a photography workshop led by a professional photographer who provided them with a set of guidelines for taking pictures. Ethical considerations were also given about the need for consent when someone's face appears in the picture frame, unless people appearing remain unrecognizable. At the end of this session, we invited participants to take pictures based on one prompt: identify the features and spaces that contribute (or not) to neighborhood vitality. As the "urban vitality" term was abstract for participants, we used the idea of "neighborhood vitality", which we defined as the ability of places to gather a diversity of people and activities in the neighborhood everyday life, contributing to people's well-being. As "spaces", we used the definition of "public space" that considers all those spaces opened to the public (either public or private ownership) (Mitchell & Staeheli, 2009). We did not set any limit on how many photographs to take, but asked participants to limit the number of photographs to 5 to send to co-facilitators. Before Session 2, participants sent via WhatsApp their five selected photographs to the co-facilitators in order to be color-printed.

Sessions 2-4 consisted of small group discussions of 2 hours each, where we discussed selected photographs of each participant. Discussions were held both in Catalan and Spanish. In each session, participants could bring new photographs or continue presenting those sent in the previous session, in case there had not been sufficient time to comment on them. Co-facilitators used an adaptation of the extended SHOWED mnemonic method to guide discussions on why participants took that particular photograph and what it meant to them (Gullón et al., 2019), which consisted of 3 questions: 1) What do you see in the photo?, 2) What is the story behind the photo?, 3) How does this relate to neighborhood vitality, life, and care?

Images were used as a starting point to strike up deeper discussions about how urban spaces contributed to neighborhood life, and their experiences as young people within the urban space. Once one participant introduced a topic through a picture, other participants interrupted the conversation to contribute with their own reflections and pictures. Co-facilitators only interviewed during these small discussion groups to ask for more details, clarifications, and deeper explanations, to involve everyone, and make sure that each participant had sufficient time to discuss their selected photographs with the group equally. Co-facilitators also asked participants to situate their images on a map of the district. A participatory analysis was held in the last group session. Following the guidelines of Wang and Burris (1990), participants sorted all photographs into categories according to the discussion generated from these images. Later, researchers used these categories as a baseline for coding in Atlas.ti® software.

9.1.6. Results

Participants selected a total of 51 photographs to be discussed during the group sessions. Through participatory analysis with participants, those photographs were sorted into 11 categories related to the elements contributing to neighborhood vitality, which served as an a priori list to identify major topics. Then, researchers conducted a new coding process, where these categories were further reduced into six topics: (i) outdoor public spaces, (ii) urban furniture, (iii) facilities & local businesses, (iv) buildings, (v) orography, and (vi) the symbolic meaning of vitality.

Theme 1: Outdoor Public Spaces

Several open public spaces were identified as scenarios of urban life in the neighborhood. Participants highlighted squares, intra-block spaces, and parks, in particular. Squares were one of the first elements identified as key spaces for life, mainly due to the sustained presence of human activity, as 'there are always people, children, adults, elders... it's always crowded'. (P.S. male, 19 years old). Participants consider squares to be places to stay, to 'linger as equals', meeting places where people greet others, even if they are unknown. Indeed, participants also highlighted the importance of squares as many activities and celebrations (such as carnival time, New Year's Eve, etc.) take place there. However, participants' analyses revealed the existence of 'squares that are not squares'. To illustrate this idea, one participant referred to certain squares that are 'hidden, surrounded by residential blocks, and are not accessible. They are dead spaces, there are no shops, there's nothing' (AM.M., female, 18 years old). These places meet the physical requirements to be considered squares but fail to become valuable spaces due to their lack of vitality and use.

A similar idea emerged when one participant remarked on the existence of intra-block pedestrian spaces. These spaces resulted from the massive housing urbanization process that created a configuration of 'a huge block with many squares in the same block' although they were not designed as such. These areas have the potential to gather human activity as 'it's all about pedestrians, there are no cars' and thus they could be considered as spaces for socialization. However, two participants stated they did not always reach their potential as vital places, as they are often perceived as unsafe. Participants particularly highlighted that women tend to avoid these areas as they can be scary because of the truncated viewing points and hidden corners. These are examples of urban spaces with the formal requirements to gather urban vitality, but that fail to do so because of issues with safety and lack of proper diversity of land use mixes. Other squares failing to meet their vitality potential might be caused by different issues such as the one noted by another participant who acknowledged that certain

squares are losing their public sense, as 'there are often too many bar terraces in squares [...], it's becoming a place where the private sphere is everywhere and it's very regulated as to what leisure activities I can and can't do; in that respect it's not public' (A.M., male, 20 years old).

Other spaces such as parks are valued precisely because of their capacity to gather activities that do not necessarily involve consumption, such as walking, walking the dog, meditation, sports, dancing, or sunbathing. It is this unregulated aspect of parks that leads them to be perceived as important places for life and wellbeing. Participants highlighted that in most neighborhoods within Nou Barris District there is a great availability of parks, which they mainly use for socialization. Of most interest is the fact that they locate parks in contraposition with the absence of parks. In the experience of the participants, the absence of parks usually leads to the privatization of public space through bars and restaurants and the commodification of leisure and socialization: 'The cool thing about neighborhoods is that there are parks. For example, in Vilapiscina neighborhood, as there is no green area, it's almost filled with bars.' (A.M., male, 20 years old).

Theme 2: Urban Furniture

Places to sit down and rest were constantly valued as creators of urban vitality. Several pictures of benches were selected by participants to be discussed, and all participants were unanimous at recognizing their direct influence on neighborhood life, as they transformed streets and squares from spaces for solely circulate into places in which to stop and stay. For participants, urban benches are often seen as meeting points for both the young and the old, 'I used to go and sit on the benches outside because that's where all the people from the neighborhood meet. We just sit there and do the usual things: talk, take photos, fool around...' (M.R, female, 22 years old). Interestingly, one of the participants had a picture of a bench (Figure 30a) that served as a trigger for discussion on how public space, and particularly benches, were such an important asset for her mental health and care. For that participant, benches were a place on which to frequently sit and reflect when the days felt particularly bad, or when she wanted to cry, either alone or with

Figure 30. Photographs of urban furniture.

Figure 30a. 'Here is a picture of a bench were I have cried'. (M. V., female, 17 years old).

Figure 30b. "Tables are a "multispace", for parents with their children, young people and elders". (M.R., female, 22 years old)

Figure 30c. "This picture is like a scene of a terror film, you feel something bad is going to happen to you" (H.R., female, 21 years old).

Source: photographs taken by participants.

others. Other uses were attributed to benches, as another participant explains, she likes to just observe the movement of the people passing by and 'imagine how their lives are; I play around and invent a script of their conversations and I even try to guess their names' (A.G., female, 15 years old).

Both public tables and fountains were also mentioned as urban furniture with a direct influence on neighborhood life (Figura 30b). Tables, mostly found in parks, are used for all age groups that occupy them in different moments of the day and for diverse purposes: the elderly for playing cards and dominoes, parents and kids for birthday celebrations, and young people to stay around with music, soft drinks, or a bong. Public fountains for their part appeared to be an important asset contributing to making places more appealing. Fountains evoked happy memories of playing with water in summer when they were much younger, something that children still do today, even if legally forbidden. Public fountains, however, were also a source of discontent as participants see them serving no real purpose, other than beautifying the space. They suggest that 'it would be great if they could set it up as a little beach. Can you imagine? The beach in Nou Barris' (A.M., male, 20 years old).

One participant also drew attention to the lack of street lighting, as dark spaces discouraged pedestrian human activity during night time. The picture in Figura 30c was used to point out the lack of street lamps, particularly in urban areas close to the hill: 'I took this photo because it represents the opposite of urban vitality. Places where I walk fast because I feel insecure' (H.R., female, 21 years old).

Theme 3: Facilities & Local Businesses

Facilities were a major theme revealing their effect on neighborhood vitality, as participants consider them important both for socializing and providing necessary daily services. Participants highlighted a variety of amenities, such as football fields or dog parks, with a special emphasis on cultural facilities. They stressed their concern as to how these cultural amenities were a gathering place but also provided an opportunity to access to certain activities and social capital. For example, one participant mentioned the library as a space where 'I meet up with my friends or classmates to do school work and study in a focus atmosphere. At home I can't.' (A.G., female, 15 years old). Another participant highlighted that, thanks to cultural centers he had the opportunity to play an instrument, form a music band, and learn new skills (Figure 31a).

Participants also expressed their concerns on how these facilities interact with public space and neighbors. Overall, the diversity of facilities attracted people to the street and guaranteed human presence during the day. However, participants also noted that certain activities, especially those frequented by young people, could create discomfort with respect to other users. For example, two participants mentioned the skate park, very popular among young skaters of the district and the city, and another participant pointed at the Youth Civic Center (the *Kasal* de Joves), both generators of disputes among other neighbors due to noise problems. Hence, vitality also involves dealing with the mismatch of diversity of uses, needs, and preferences of different population groups. One of the participants' proposals to solve this issue was, for example, to relocate the *Kasal* to a more remote area because in this way it would contribute to avoiding being a nuisance and revitalizing a disused space.

Participants also highlighted in their photographs the influence of local businesses on street life, mainly those related with food consumption. On the one hand, they valued the diversity

of retail options, which has the potential to attract different kinds of people and for different needs that often complement each other. Municipal markets, for instance, are mainly frequented by seniors. Our participants noted that they require certain skills to operate, such as knowing what to ask for, how to queue, how to ask for specific items, which sometimes could act as a barrier for younger generations, but they also valued that they offer a great level of social interaction, resulting in a very familiar atmosphere: 'people know you... I get there and when I go with my grandmother they always say to me: "You've grown up so much!" And they start talking to me as if they've known me all my life, and sometimes I don't even know who they are... Now with time I do, but not when I was a kid. They know how old I am, what my name is... they know everything. And I think that's beautiful' (A.G., female, 15 years old). Supermarkets, by contrast are easier to use, more convenient due to their long opening hours and thus more popular among younger adults. Other small food stores, particularly found in central streets, were valued through their contribution to diversity as they often sell more specialized products, for example, groceries used by specific immigrant communities, therefore attracting diverse people, thus, increasing vitality (Figure 31b).

For participants, the other key businesses for vitality of Nou Barris were the bars. But that was not the case for everyone. On the one hand, the presence of bars was perceived as a guarantee for the presence of people in the street: 'there are many many bars and they are always crowded' (M.R., female, 22 years old). Bars are part of people's daily activity and leisure, a place to have a drink, eat something, hang out, and meet with others (Figure 31c). For some, there was even an attachment feeling with those family-owned bars, as they considered that money spent there was kept within the neighborhood. Not all participants valued bars equally however; for some, the presence of 'too many bars' was a negative attribute that was hurting vitality. These critiques were mainly directed towards terraces that monopolize streets and public space, hence, killing alternative activities: 'it's cool that it's not all a bar... because at the end means a lot of alcohol,

Figure 31. Photographs of facilities and local businesses.

Figure 31a. 'It is a concert in the civic centre of Nou Barris. There is always live music there and people go to listen to the groups, even if they are not very famous' (P.S., male, 19 years old).

Figure 31b. 'When I walk past this shop, it is always full of people buying something. They sell very specific products.' (A.G., female, 15 years old).

Figure 31c. 'I really enjoy the moment of taking a coffee in a bar of the neighborhood with a friend of mine. It is our care place' (H.R., female, 21 years old).

Source: photographs taken by participants.

coffee... it's cool to do other things too' (A.M.M., female, 18 years old). The reason for this high presence of bars was identified by one participant as due to the lack of diversity of other business types: 'the presence of bars is more noticeable here because we don't have anything else, for example, there are no clothing shops, practically' (A.M.M., female, 18 years old).

Theme 4: Buildings – what it is inside and what we see from outside

As with most of the population in Nou Barris, all our participants lived in large apartment blocks. This particular building typology, often several stores high, invites socialization and social contact in the building's staircase where people meet and greet. Loose social ties and connections with unknown and diverse people are thus created, even just offering or requesting help when needed. This diversity of people living in large apartment blocks, however, can also generate discontent and disputes because of inconveniences such as noise or foul smells: 'The neighbor next door prays about 20 times a day. I understand him, yeah, because it's his religion, but he shouts a lot and wakes me up.' (A.G., female, 15 years old). Overall, there was a consensus on the fact that population density and the sharing of inner-building spaces meant increased social contacts and improved cohesion among neighbors. Participants however, also stressed that it is not always easy to build relationships with confidence, identifying two main reasons. First, because of the building's dimensions: the larger a building is, the more difficult it is to build a community. And second, because in recent years people are no longer homeowners but renters, which leads to a high rotation of tenants: 'as people quit more, that makes people know each other less' (H.V., female, 21 years old).

Buildings also appeared to be relevant because of their relationship with public space. Particularly, participants emphasized elements such as balconies and windows as important assets for neighborhood vitality. They represent an in-between space between the private and public spheres One participant pointed out that through them people interacted with other neighbors who were on other balconies and at windows, or on the streets: 'I don't have a window downstairs, but a friend does, so if I go for a walk with my dog and I pass by, I spend about 15 minutes talking with her from the window. Or, for example, her cousin lives across the street, so they start talking from balcony to balcony' (A.M.M, female, 18 years old). Another participant expressed her concern on the importance of balconies for the safety of public space, as they enable the presence of eyes on the street while being at home: 'You can see the kids and people playing in the park from your balcony ' (M.R., female, 22 years old).

Theme 5: The Orography – privileges of altitude

One frequent asset depicted in participants' photographs was their recurrent allusion, with a positive connotation, to the district's orography, particularly of the northern neighborhood of Roquetes. Participants claimed that the neighborhood itself was a kind of panoramic viewing point, which they enjoyed, for example, as the case of a rooftop square, the Roquetes square (Figura 32a): I went there with Ale after a very stressful meeting and we took pictures. You can see the whole of Barcelona and even the sea, it gives me a lot of peace (H. V., female, 21 years old). Hence, the views were seen as an incentive that encouraged people to be in the square.

Some participants defined their geographical position as a privilege. The closeness to the hill was pointed out as a characteristic which is distinctive from other neighborhoods of Barcelona, as they counted this as a vital place within a natural area; considered as a source of health and wellbeing. For two of the participants, the hill was both a social encounter where one can meet with others (for example, for talking, walking the dog, or to pick asparagus plants), and a place

to be alone and enjoy the silence, for example, 'go for a walk and feel great' (Figura 32b). However, this vitality happened exclusively during the daytime, as most of the participants highlighted that at night, this area was considered dangerous.

At one point in the discussion the co-facilitators asked participants if the slope negatively affected the neighborhood vitality. Surprisingly, they generally did not see it as problematic as, since they lived there, they got used to escalators: '(we) are so used to them [the escalators] that we don't even notice them anymore, we don't find them strange' (A.M.M., female, 18 years old).

Another element that contributed to accessibility, and hence to vitality, in such steeply sloped neighborhoods was the mini-bus service (*Bus del barri*). The bus acts as a connector between distant neighborhood nodes, and is highly valued in its role as participants connected them with different facilities and points of interest of the District. Particularly, they highlighted its importance for elderly women as it helped them to carry their trolleys when they returned from the municipal market. Participants acknowledged the deficiencies of the bus in terms of frequency and space, they complain the buses are very small, but they look up to this service with appreciation, as they used a great deal of time of the discussion explaining several anecdotes used inside the bus. One participant considers it as a representation of the neighborhood, literally saying 'Service sucks, but, in spite of that, there is a very familiar atmosphere and even if you don't know anyone, you'll be able to talk to someone on the way back home' (A.M.M., female, 18 years old).

Figura 32. Vital spaces at altitude.

Figura 32a. . 'It is our lookout point. We see people in the streets that are below and also the whole of Barcelona, and even the sea' (M.R., female, 22 years old).

Figura 32b. 'We are at 5 minutes distance from the hill, and there is a lot of neighborhood life here' (A.M., male, 20 years old).

Source: photographs taken by participants.

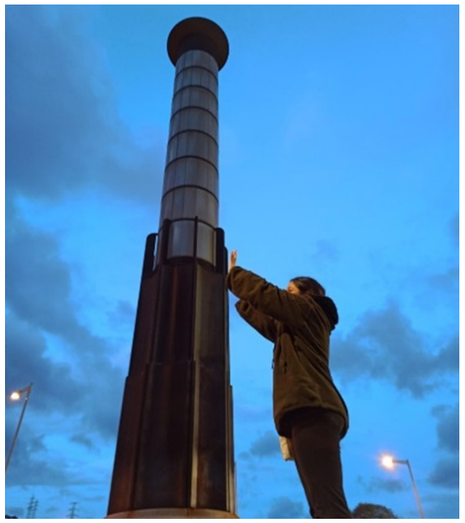
Theme 6: The Symbolic Meaning of Vitality – beyond the physical environment

Symbolic meaning was a topic of discussion that emerged during the PhotoVoice sessions when referring to vitality. Participants recurrently noted the significance people attributed to physical spaces that make them feel alive. For example, some participants talked about a cylindrical tower resembling a coastal lighthouse whose utility for them was as a meeting point of reference (Figura 33a). Another example was a parking entrance that children used as a slide, hence, illustrating that what brings vitality to urban space is that people use it as they want to, and not how they are supposed to (Figura 33b). Public space also comes alive due to pop-up activities that are community-organized. Particularly, they explain that popular parties in the street 'made for the neighbors and for the neighborhood, are about life, and are about care, because a lot of people who are there have helped to organize it, so you get to know everybody. Besides, the whole time you're reminded: "shi**y attitudes are not tolerated".

Figure 33. Vital spaces because of their social meaning.

Figure 33a. . 'If I'm meeting someone, I always wait for him or her in this place because it is very easy to identify it; everybody knows where it is' (A.M., male, 20 years old).

Figure 33b. 'This picture is in a popular party in the neighborhood. That's what we need as young people, to party in our own neighborhood and not having to move to macro-parties in Barcelona, because indeed we feel less safe' (H.V., female, 21 years old).



Source: photographs taken by participants.

And when they happened, the party has been stopped until everyone can feel at ease.' (H.V., female, 21 years old). This community commitment, in turn, reinforces the perception of safety which, ultimately, they believe that what makes a neighborhood vital is that you feel safe, 'like in a town'.

9.1.7. Discussion

Several components of urban vitality were identified in the analysis of pictures and group sessions of the PhotoVoice process. On the one hand, diverse scenarios and elements of the built environment were found to encourage the presence of people in the streets. On the other hand, vitality was also expressed by an intangible dimension linked to social relationships within the neighborhood, and the meanings that young people attach to particular spaces.

Regarding the physical features that contribute to urban vitality, participants mainly referred to two main sources: at the micro-scale, elements of urban furniture and urban design, and at a broader scale, the existence of mixed-uses environments. Regarding urban furniture and design, a classification of three categories was identified, organized from more to less essential for vitality: pre-requisites for vitality, vitality catalysts, and vitality boosters. First, pre-requisites for vitality are those elements that are a precondition for the existence of vitality, such as street lightning and the presence of squares (Painter, 1996). Without them, vitality cannot appear as people will either have no place in which to gather or might feel too insecure to spend meaningful time in the public space, ending up in what Sennet called as

"dead spaces" (Sennett, 1977). Second, other elements can be classified as vitality catalysts, that is, elements that increase attractiveness, and then, contribute to the presence of human activity (Liang et al., 2022) such as fountains, tables, and benches. Last, vitality boosters are those elements that provide feedback from vitality. That is, physical features which, when placed within an already vital space, simultaneously benefit from it and in turn contribute to strengthening that vitality. Among these elements participants highlighted the presence of windows, balconies and, again, benches. Windows and balconies are considered as transitional spaces between private homes and public spaces, that contribute to the presence of "eyes on the street", an informal surveillance system that helps the use of public space, especially for those more vulnerable population groups (S. C. Brown et al., 2009; Gehl, 2010; Webb Jamme et al., 2018). In the case of benches, those that are located in vital encounters serve to gather people in the street (Akinci et al., 2021) as well as used by the Baudelarian *flâneurs*, the casual wanderers, to observe other people's activity, what Jacobs famously labeled as the *sidewalk ballet* (Jacobs, 1961).

On a neighborhood scale, participants found the combination of a diversity of local business and public spaces, which in turn are able to foster diversity of people and activities, to be a key aspect for vitality. On that note, two main elements were repeatedly highlighted: the presence of food retail stores and bars. On the one hand, markets, small food stores and supermarkets were recurrently mentioned as one of the most important drivers for vitality in Nou Barris, confirming previous evidence on the relevance of food environments for neighborhood daily life in peripheral low-income districts (Díez, Conde, et al., 2017). The presence of local grocery stores and supermarkets not only meet a basic everyday need within the neighborhood scale but also constitute pedestrian traffic nodes that concentrate people and thus increase the potential of serendipitous encounters and casual socialization. While the study by Diez et al. (2017) found some negative connotations linked with the presence of supermarkets, such as their lack of personal customer service in comparison to traditional food stores and markets, our participants valued them, positively stating that it is the coexistence of these different store types that can enhance vitality because they respond to different customers' needs at different times of the day. Indeed, participants highlighted supermarkets' broader opening hours as positive for urban vitality because they contribute to a major presence of people in the street during different hours.

On the other hand, bars were stressed as another key element for vitality in Nou Barris. Bars and restaurants have been identified by some as "third places" in contraposition to home (first place) and work space (second place) (Oldenburg, 1999). In some cultures, theses spaces can represent a bridge between private and public domains, spaces where people can gather and hang out with others. However, participants in our study also identified areas with particularly higher bar concentrations, which in some cases might result in monofunctional public spaces and neighborhood activities, thus, debilitating diversity. In Barcelona, the increasing tertiarization of the city's economy, specifically in the restoration sector, together with the latest changes on consuming patterns, have led to the democratization of the access to bar terraces (Frago, 2020). Consequently, there has been an increasing occupation of public space, a phenomena mainly identified in touristic attractive neighborhoods of the city (Elorrieta Sanz et al., 2021). However, this PhotoVoice corroborates what was pointed out in a previous study that identified bars clusters in peripheral neighborhoods, and warned about the negative impacts they could have on vitality (Gómez-Varo et al., 2021). In order to preserve diversity, participants insisted on the need for spaces that counterbalance private uses and at the same time host activities that do not necessarily imply economic consumption, such as green areas or community-based cultural facilities. These findings are in line with recent evidence on

how the interaction of public and private ownership of urban spaces can generate publicness (Leclercq et al., 2020) and how accessible and inclusive spaces may offer the opportunity for a variety of users and activities. According to our participants, a proper mix of public-private ownership generates a higher degree of publicness.

Another important issue, in order to understand urban vitality, is to identify those elements that actively discourage street life. Contrary to most of the body of literature, that often considers excessive slopes to be negatively associated with walking activity, and thus human activity (Meeder et al., 2017), our participants did not identify the slope or the existence of border vacuums as negative assets for urban vitality. A possible explanation for this particular result might be that our group of young participants have grown right after the interventions implemented in Nou Barris by the Neighborhood Law of 2004, one of the largest urban renewal projects launched in Europe during the first decade of the 2000s in deprived areas (Mehdipanah et al., 2013). The Neighborhood Law was an important investment to provide general improvements in physical infrastructure, transportation, and accessibility in selected deprived areas in the Barcelona Metropolitan Region (AMB). Features such as escalators and public bus services help overcome accessibility problems in steeply-sloped areas, and have, according to the participants, now been completely integrated in the neighborhood daily dynamics, connecting people with public spaces, facilities, and services. Another plausible explanation for not mentioning these elements as negative could be the fact that the informants in this research are a group of able-bodied young people who have all grown up within the neighborhood and thus have grown accustomed to its physical characteristics. Furthermore, their young age may also reflect a low share of mobility of care trips (Sánchez de Madariaga, 2013), hence, their mobility is not affected by having to accompany dependent people in their charge, or by having to carry objects such as strollers or wheelchairs that are often part of care-related trips.

Beyond the physical environment, vitality is also formed by a social dimension (Montgomery, 2007). Jacobs considered that neighborhoods needed a certain level of social mixture to guarantee vitality, and she defended that this could be achieved by the presence of buildings of different ages (Jacobs, 1961). Under her view, buildings from different construction eras would offer diverse rent ranges and contribute to mixing people with different backgrounds, earnings, and life-stages. A higher population diversity combined with the proper land use mix would create a bustling public space use with different population groups, making use of the public space at different hours with distinct purposes, and in a variety of activities which would result in higher levels of vitality.

Our study provides valuable insights into the relationship between population diversity and perception of urban vitality, despite facing challenges in finding an explicit positive association between the two. While our results did not show a clear positive association between population diversity and perception of urban vitality, we found a significant connection between the number of long-term residents in a neighborhood and a heightened sense of community belonging. This collective sense of belonging was found to positively contribute to urban vitality. Our participants seemed to value people's years of experience of living in the neighborhood which extended beyond the age of the buildings. Participants stressed that vital places need a minimum of attached people who turn the unknown city into a familiar place, people that are part of the social network (Clark et al., 2017). In the specific context of a low-income area such as Nou Barris, our results suggest this could be evaluated by a certain minimum proportion of homeowners, as renters are considered to be a less permanent population (Basolo & Yerena, 2017). That would support recent findings indicating that

homeowners and residents with longer community tenure have higher odds of being involved in the community activities (Ghimire, 2021). Therefore, our results suggest that recent works using synthetic measures to reinterpret the principles of Jacobs in current cities such as the Jane Index (Gómez-Varo et al., 2022), may better assess the diversity of social composition by using an indicator that considers the rotations of residences, rather than a building age mix indicator.

Vitality is also understood as the result of the meaning attributed to places. During the discussion, some urban spaces were mentioned as being used in ways for which they had not been originally designed, and that use was diverse depending on the population group. Each group tends to adapt public spaces to their own needs and in the case of our young participants, these adaptations mainly involved converting public spaces into places for care and leisure. Crying on a bench or hanging around with friends in a safe place, for instance, were activities stressed as crucial for the mental health of our participants. These findings contribute to further our understanding of the complex relationship between the built environment and youth mental health (Buttazzoni et al., 2022; Fleckney & Bentley, 2021).

Leisure activities have also been a central topic in photographs of vital spaces, which take place both in outdoor spaces and in sport and cultural facilities. However, certain activities recognized by young people to contribute to vibrancy and street life were often seen as undesirable in the eyes of other older adults, who considered they were posing a threat to social order and disturbing the peace of public spaces (D. M. Brown, 2013). Our participants generally acknowledged that fact and suggested the need to create spaces for young people where they could decide their own activities with no external interference. That strategy however, poses the risk of reinforcing the position of youth as a problematic group that needs to be separated from the rest of the society, instead of negotiating a community shared idea of what a vital place means (Malone, 2002).

Taken together, the findings of this study help us to understand urban vitality based on youth daily life experiences, by mean of a PhotoVoice process. The use of photographs was key to foster discussion of urban vitality according to the rationale of Jacobs. Pictures also helped to introduce nuances and local particularities into the analysis of the different components of vitality. During the group discussions topics came out organically with only minor interventions of co-facilitators, as photographs facilitated young participants to speak about their everyday lives *in their own ways* (Volpe, 2019). None of the participants had any difficulties using cameras and their own smartphones facilitated the photo shooting process.

Our study, however, is not without limitations. The small size of the group along with the fact that all participants were recruited at a young civic center located at the center of the district somehow limits the generalizability of the results. Admittedly, one of the major limitations of this research is linked to the intrinsic constraint of PhotoVoice projects: it is a very time-demanding technique for participants. As young people in a formation stage, they had time restrictions that affected their involvement during the process, for example, having limited time to invest in photo shooting. This project was conducted under a context of COVID-19 restrictions, which might have affected participants' narratives and discourse, and also made impossible to involve a larger group as previous research has done (Gullón et al., 2019). The weather conditions may have also affected the results, as the study was conducted during autumn months. Although autumn temperatures in Barcelona are moderated, there are less hours of light and a more limited street life. Future research wanting to deepen on the implications of this discussion might want to consider larger sample sizes or creating parallel photovoice groups and selecting other season of the year.

9.1.8. Conclusion

This study set out with the aim of assessing urban vitality using a qualitative methodology by means of the PhotoVoice technique. Most of the empirical evidence on urban vitality is quantitative-based and uses objective measures, however, there is still a need to explore urban vitality throughout subjective perceptions, based on everyday life experiences. The novelty of this research is also found in the urban context and population group selected for the analysis. Vitality is frequently analyzed in central and wealthier city areas, while there is a lack of literature analyzing vitality in more peripheral environments such as our study case, the low-income district of Nou Barris, located in the outskirts of Barcelona, northeast Spain. Our research also focuses on youngsters' perception of urban vitality, a population group frequently overlooked within the urban discussion. Our results deepen our knowledge on the urban elements that contribute to urban vitality from the perspectives of young people.

PhotoVoice approach resulted an effective methodology to gain insight into urban vitality as seen through the eyes of young people in their daily lives. The photographs played a crucial role in facilitating discussions and adding depth and unique perspectives to the analysis. The group discussions flowed naturally, and the participants had ease in capturing photos with their own smartphones.

Results suggest that urban vitality is composed of both physical and intangible components. The physical components of urban vitality include elements of urban furniture and design at the micro-scale and mixed-use environments at the broader scale. Vitality is enhanced by pre-requisites such as street lighting and squares, and elements that increase attractiveness, such as fountains, tables and benches. Additionally, windows, balconies, and benches contribute to vitality by serving as transitional spaces and providing feedback. On a neighborhood scale, the presence of a diverse mix of local businesses, public spaces, food retail stores and bars, is seen as key for vitality. However, the over-concentration of certain commercial activities, such as bars, in some areas can result in a loss of diversity. To counteract this, spaces for activities that do not necessarily involve an economic expenditure and food or drink consumption, such as green areas and community-based cultural facilities, are seen as necessary to preserve diversity.

According to participants, urban vitality is also related with the meaning attributed to places, which they adapt their own care and leisure necessities. Leisure activities were found to be central to youth's experiences of vitality in public sphere, found very relevant for their mental health, but there is a complex discrepancy between what older and younger adults consider as desirable in public spaces. The study highlights the need to balance the creation of spaces for young people with avoiding the reinforcement of their position as a problematic group. The study also found a relationship between a long-standing presence in a neighborhood and a collective sense of belonging, which contributes to urban vitality too.

Overall, the findings of this study have a number of important implications for future practice. Our findings incorporate new elements into the discussion of what contributes to urban vitality based on daily experiences and real use of the city. Future studies will need to analyze the relationship between qualitative assessments of urban vitality, seen from the lens of everyday experience, with objective quantitative assessments of urban vitality gathered using GIS methods. Our findings also offer suggestions for urban practice, as they suggest several courses

of action to improve urban vitality, particularly in peripheral low-income areas. In a physical dimension, policy could be aimed at promoting mixed-use developments, with flexible urban furniture and permeable building constructions that allow a dialogue with and from the public space. Alternatively, reinforcing a strong network of local and diverse businesses is also likely to result in positive results. Particularly, food-related businesses are part of the backbones of urban vitality, although our findings also alert us of the monopolization of neighborhood daily activities especially in the case of bars. In a social dimension, public action should be aimed at housing policies that promote social diversity in neighborhoods while allowing long housing tenure and encourage community-based initiatives which reinforce people's attachment to urban places, and therefore, end up encouraging the use of public areas and fostering human interaction in the public space.

PARTE V:

DISCUSIÓN Y CONCLUSIONES

Capítulo 10

Discusión conjunta de los resultados de la tesis

10.1. Discusión entorno a las preguntas de investigación y contraste de hipótesis

En el presente capítulo, se lleva a cabo una discusión conjunta de los principales resultados obtenidos en los cinco estudios de caso realizados. El objetivo es integrar y analizar de manera conjunta los hallazgos de los estudios de caso, permitiendo una visión global de los resultados obtenidos y su relevancia en relación con las preguntas de investigación que plantea la tesis doctoral. Con el fin de facilitar la interpretación de esta discusión, se ha estructurado en función de las preguntas generales y específicas de investigación, y las hipótesis presentadas al inicio de la disertación (Capítulo 2).

Pregunta 1: ¿Qué relación existe entre las condiciones para la vitalidad urbana según Jacobs (1961) y las características de las ciudades mediterráneas actuales?

- ***Pregunta específica 1.1***. *¿En qué medida las teorías de la vitalidad urbana propuestas por Jane Jacobs en 1961 son aplicables al estudio de las ciudades mediterráneas actuales y cómo han sido ampliadas y actualizadas en el contexto contemporáneo?*

  Hipótesis 1: Las teorías de Jane Jacobs sobre la vitalidad urbana son válidas y relevantes para analizar las ciudades mediterráneas actuales, pero requieren una reinterpretación teórica que incorpore las corrientes de pensamiento contemporáneas.

El presente estudio se fundamenta en los conceptos de vitalidad urbana expuestos en el libro *Muerte y vida de las grandes ciudades* (Jacobs, 1961). El objetivo de este estudio es revisitar dichos conceptos, surgidos originalmente en la ciudad estadounidense de Nueva York durante la década de 1960, en el contexto actual de la metrópolis mediterránea de Barcelona para entender su relevancia teniendo en cuenta una visión contemporánea.

Al realizar una revisión teórica actualizada, se puede confirmar la hipótesis planteada, ya que los paradigmas que guían la planificación urbana en la actualidad, como el de la sostenibilidad, la justicia y el género, están reinterpretando los principios teóricos jacobsianos. Las condiciones de vitalidad defendidas por Jacobs (como la densidad, la diversidad y la accesibilidad) son ampliamente aplicables para afrontar los retos urbanos actuales, aunque es importante integrar estas nuevas perspectivas.

Sin embargo, al pasar de los principios teóricos a la práctica y revisar los estudios aplicados que han utilizado los principios de Jacobs para evaluar las ciudades actuales, son numerosos los estudios que reproducen de manera literal las condiciones originales expuestas por Jacobs en indicadores que miden las características del entorno construido. Estos indicadores

incluyen la diversidad de usos a través de indicadores de mezcla de usos del suelo, la densidad de población, la accesibilidad a través de indicadores de caminabilidad, y la preservación de edificios antiguos. Estos estudios asumen que estos indicadores y condiciones son positivos per se, ya que, según la extensa literatura, generan altos niveles de presencia de personas e interacción social en las calles (Lunecke & Mora, 2018; H. G. Sung et al., 2013; H. Sung & Lee, 2015). Sin embargo, los resultados de este estudio sugieren que la vitalidad urbana, medida mediante estos indicadores del entorno construido, no es una cualidad única, sino que se traduce en múltiples realidades cotidianas, algunas de ellas problemáticas para el bienestar y la calidad de vida de las personas que habitan en las ciudades. Por ejemplo, en el estudio de caso 2 se evidencia que la vitalidad urbana tiene lugar en escenarios sociodemográficos diversos donde se dan dinámicas de vulnerabilidad social. O, en el estudio de caso 3, se sugiere que, en lugares con niveles de diversidad similares, existen escenarios donde los usos están más orientados hacia el turismo, lo que dificulta las dinámicas de proximidad y la vida cotidiana de la población residente en los barrios.

Esto está relacionado con cómo se ha operativizado la vitalidad y qué indicadores se han utilizado, ya que los análisis que utilizan indicadores objetivos clásicos del entorno construido suelen desatender las nuevas realidades y debates que se dan a causa de la aparición de nuevos fenómenos urbanos. En este sentido, esta investigación sugiere que el análisis de la vitalidad urbana debe abordarse desde una visión contemporánea. Esto implica también no limitarse a entender cómo deben ser las características físicas de los entornos generar actividad humana en la calle, sino que debe ir más allá, es necesario comprender cómo las condiciones de los entornos vitales que potencial la actividad humana impactan en la vida cotidiana de las personas, analizando la vitalidad, tal como nos proponen las visiones contemporáneas, desde la esfera de la proximidad, la vida cotidiana y la equidad social.

De esta manera, esta tesis contribuye a la reinterpretación en la conceptualización y operativización contemporánea de ciertas condiciones de vitalidad urbana en relación con las definidas originalmente por Jacobs, especialmente en lo que respecta a las condiciones para fomentar la diversidad, la densidad y la accesibilidad.

Según las condiciones teóricas para la vitalidad definidas por Jacobs, en primer lugar, las ciudades deben albergar una diversidad de actividades, a partir de una diversidad comercial que garantice una combinación de usos primarios y secundarios. No obstante, se ha constatado en el estudio de caso 3, que la diversidad desde un punto de vista cuantitativo no siempre se traduce en un tejido comercial que tenga la capacidad de satisfacer las necesidades de la vida cotidiana de los residentes. Estos resultados sugieren, de acuerdo con evidencias previas, que los paisajes comerciales diversos a menudo se encuentran en barrios gentrificados (Sánchez-Aguilera & González-Pérez, 2021). En este sentido, esta investigación contribuye al desarrollo de indicadores de diversidad que van más allá de la diversidad desde el punto de vista cuantitativo, diferenciándose de la mayor parte de estudios que miden la diversidad a través de índices de entropía. Así, en los indicadores de diversidad utilizados en esta tesis se ha otorgado mayor valor a aquellas actividades relacionadas con el comercio cotidiano (como servicios básicos de educación, salud y alimentos), orientando cualitativamente el indicador hacia una diversidad cotidiana. Además, se ha complementado el análisis de la diversidad poniéndola en relación con otras dinámicas contemporáneas, como la vulnerabilidad social y la presión turística. Esto ha permitido agregar matices al concepto de diversidad, evidenciando que en realidad se hallan en el territorio diferentes diversidades. No obstante, es importante destacar que futuros estudios deberán seguir aportando matices a este análisis de la diversidad de actividades. Por ejemplo, tratando de comprender cómo afectan nuevos hábitos como la compra por internet a la diversidad comercial y a los hábitos de movilidad asociados a las compras (Arranz-Lopez et al., 2023). O también, por ejemplo, considerando una perspectiva cualitativa de la diversidad (Fresnillo, 2018; Goossensen et al., 2023).

En segundo lugar, para garantizar la diversidad, según Jacobs, un factor clave es la presencia de personas con perfiles sociodemográficos diversos en los barrios. Sin embargo, asegurar esta mezcla social representa un desafío en un contexto de aumento de las desigualdades urbanas a nivel global, y en particular, como se observa en la metrópolis de Barcelona, donde se están produciendo dinámicas de suburbanización de la pobreza (Porcel et al., 2018). Para Jacobs, la diversidad de perfiles sociodemográficos se lograba a través de una mezcla de diferentes tipos de edificios y la conservación de edificios antiguos, refiriéndose a viviendas asequibles. Sin embargo, en la actualidad, la edad de los edificios no siempre es un indicador de accesibilidad económica. Por lo tanto, al operacionalizar cuantitativamente la diversidad de edificios, en el estudio de caso 1, más allá del año de construcción, que es lo que hasta ahora hacían la mayoría de estudios hasta entonces (Delclòs-Alió & Miralles-Guasch, 2018b; Fuentes et al., 2020; Paköz et al., 2022), se ha considerado también la variable del precio de acceso a la vivienda. Además, los resultados del estudio fotovoz de esta tesis, el estudio de caso 4, sugieren que para asegurar una diversidad social, es necesario contar con ciertos niveles de permanencia de la población residente, a fin de evitar la constante sustitución de habitantes causada por la lógica del mercado. Esta cuestión relativa a la vivienda constituye un aspecto que debe ser abordado en futuras investigaciones sobre la vitalidad urbana.

En tercer lugar, otra condición fundamental para la vitalidad urbana a abordar en la discusión es el concepto densidad. Tanto en esta tesis como en investigaciones anteriores, se ha interpretado la densidad de población como un requisito fundamental para la vitalidad urbana (Delclòs-Alió & Miralles-Guasch, 2018b; Fuentes et al., 2020; Gómez-Varo et al., 2022; Jin et al., 2017; A. M. Lopes et al., 2018; P. Zhang et al., 2023). En este sentido, el estudio de caso 1, que examina el potencial de vitalidad urbana, considera que tanto la densidad de población como la densidad de actividades comerciales y de servicios tienen una relación lineal y positiva. Es decir, a mayor densidad, mayor vitalidad urbana. Sin embargo, otros autores que abordan la investigación sobre la vitalidad adoptan un enfoque diferente al evaluar el efecto de la densidad en relación a esta (Lan et al., 2020; Meng & Xing, 2019; H. G. Sung et al., 2013; H. Sung & Lee, 2015; J. Wu et al., 2018; Ye et al., 2018). La mayoría de ellos concluyen que existe una relación positiva. No obstante, estudios recientes, realizados simultáneamente a esta investigación doctoral, cuestionan el impacto positivo de la densidad en la vitalidad a medida que aumenta en diferentes contextos. Por ejemplo, en el caso de Tokio, se ha observado que una mayor densidad de comercios y servicios está asociada a una pérdida de diversidad (Kumakoshi et al., 2021). En el contexto de Estambul, particularmente después de la pandemia, se ha encontrado que una alta densidad se relaciona con una percepción negativa en cuanto a seguridad, limpieza y salud urbana (Paköz et al., 2022). De manera similar, en el contexto latinoamericano, se ha observado que una alta densidad está asociada con una menor satisfacción con el vecindario, lo que disminuye la deseabilidad de los barrios con condiciones de vitalidad (Madrid-Solorza et al., 2023). Quizás resulte pertinente explorar, en el contexto de la ciudad mediterránea, en qué medida la densidad desempeña un papel positivo de manera lineal en términos de vitalidad. De manera similar a las condiciones de caminabilidad (Marquet et al., 2022), es importante cuestionar si existe un umbral de vitalidad a partir del cual agregar más densidad deja de contribuir al bienestar al confundir las condiciones de densidad con las de hacinamiento, tal como advirtió la propia Jacobs. Estos hallazgos abren nuevamente el debate entre teóricos y profesionales del urbanismo respecto a las diferentes propuestas de densidad urbana óptima para la creación de entornos vitales asegurando la salud pública y el bienestar (Pafka, 2022).

En relación a la condición de accesibilidad, es relevante destacar que gran parte de los estudios sobre vitalidad urbana se centran únicamente en medidas de accesibilidad basadas en la distancia al transporte público. No obstante, los principios de Jacobs, alineados con el paradigma de la sostenibilidad, resaltan la importancia de contar con entornos propicios para la movilidad activa y el uso de las calles, promoviendo entornos cercanos que satisfagan las necesidades diarias en distancias cortas y fomenten la actividad urbana. En este sentido, en el estudio de caso 1 se ha tratado de incorporar esta perspectiva incluyendo una serie de variables relacionadas con la existencia de un entorno amigable para los peatones, como la presencia de zonas de tráfico restringido, bancos y alumbrado público. Desde esta perspectiva de la accesibilidad, al examinar el potencial de vitalidad urbana en la tesis, se observa en el primer estudio de caso que se ponen en valor espacios de vitalidad menos obvios en comparación con otros, como los lugares centrales de la ciudad, donde convergen diversas redes de transporte público. En cambio, se resaltan espacios periféricos con un gran potencial para convertirse en entornos cercanos con una vida activa en las calles. Asimismo, los resultados del cuarto estudio de caso sugieren la relevancia del diseño del espacio público y la colocación de mobiliario urbano que promueva la vitalidad en las calles. Uno de los elementos mencionados es la iluminación, que adquiere una importancia significativa desde una perspectiva de género, dado que la percepción de seguridad desempeña un papel crucial en el uso de las calles por parte de las mujeres.

- ***Pregunta específica 1.2***. *¿Cómo se pueden analizar las condiciones teóricas de la vitalidad urbana de manera aplicada teniendo en cuenta diversos contextos urbanos y sujetos de análisis?*

  Hipótesis 2: Las nuevas herramientas de análisis espacial disponibles en la actualidad permiten evaluar y comprender la vitalidad urbana de manera aplicada en una diversidad de contextos urbanos y a partir de la experiencia de una diversidad de sujetos.

El objetivo de esta tesis doctoral ha sido investigar el concepto de vitalidad urbana y sus condiciones asociadas mediante un enfoque académico aplicado. Basándose en la concepción teórica de Jacobs, esta investigación ha abordado sistemáticamente el análisis de la vitalidad urbana en la metrópolis de Barcelona, haciendo uso de metodologías y herramientas innovadoras disponibles en la actualidad.

Según Jacobs, la vitalidad surge de la existencia de diversas condiciones en el entorno, y es fundamental analizarla considerando la interacción de estas múltiples dimensiones en su complejidad y a diferentes escalas. Tras haber llevado a cabo este proceso de investigación, se ha confirmado la hipótesis planteada. El enfoque multimetodológico y multiescalar propuesto en la tesis ha permitido comprender el concepto y estudiarlo aplicándolo a diversos contextos urbanos dentro de la metrópolis de Barcelona, y teniendo en cuenta cómo es percibida por diferentes grupos sociales.

Desde una perspectiva cuantitativa y espacial, se han aprovechado las herramientas de los Sistemas de Información Geográfica (SIG) y datos georreferenciados a diferentes niveles de desagregación territorial. Para abarcar la cobertura de los diversos contextos urbanos de la metrópolis de Barcelona, se ha optado por emplear bases de datos que mayoritariamente utilizan datos abiertos, permitiendo así recopilar información con una cobertura territorial a escala metropolitana.

En cuanto al análisis, cabe destacar el uso de una retícula en los estudios de caso 1 y 2, lo cual ha posibilitado un análisis a tres escalas diferentes. En primer lugar, a una escala micro, a nivel de calle, donde se ha realizado un análisis detallado al nivel de cada parcela. En segundo lugar, a una escala de barrio o distrito, al ampliar el nivel de enfoque. Y finalmente, al ampliar por completo la perspectiva, se ha obtenido una visión global de las tendencias a nivel de ciudad.

El haber cartografiado las distintas condiciones de vitalidad a través del índice JANE en una retícula también ha permitido establecer correlaciones entre el entorno construido y dinámicas sociales en las que el espacio desempeña un papel crucial. En el estudio de caso 2, se ha explorado la relación entre la vitalidad urbana y la vulnerabilidad social mediante un análisis exploratorio de datos, mientras que en el estudio de caso 3, se ha examinado la interacción entre la vitalidad urbana y la presión turística mediante un análisis multivariado espacial. A través de estos análisis, se ha identificado geográficamente escenarios específicos donde se manifiestan diversos tipos de relaciones entre las condiciones del entorno construido para la vitalidad y las realidades urbanas de vulnerabilidad social e intensidad turística. De esta manera, se ha logrado añadir matices en la interpretación de la vitalidad urbana, evitando concebirla como una cualidad neutra que por sí sola convierte los espacios en lugares armoniosos con alta calidad de vida, y planteando que los espacios con potencial de vitalidad urbana coexisten con diversas realidades socioeconómicas, algunas de ellas perjudiciales para el bienestar cotidiano.

Asimismo, la construcción del índice JANE en el estudio de caso 1, mediante la agregación de 22 variables que abarcan diferentes dimensiones de vitalidad, ha permitido desglosar las diversas condiciones que la conforman. De esta manera, se logra una interpretación más completa y también se añaden matices sobre cómo se manifiesta la vitalidad en función de las puntuaciones de las diferentes dimensiones. Esto constituye otra de las ideas centrales de esta tesis doctoral: los entornos vitales no son el resultado de una fórmula única, sino que pueden surgir de diversas combinaciones de las diferentes condiciones.

Sin embargo, esta perspectiva cuantitativa presenta ciertas limitaciones, que se abordan de manera más detallada en el Capítulo 12, en el apartado “12.1. Fortalezas, limitaciones y perspectivas de investigación futura de la tesis”. En la discusión de esta hipótesis, se identifican dos limitaciones relevantes. En primer lugar, cabe reconocer que el análisis del potencial de vitalidad urbana se basa en variables objetivas derivadas de una definición teórica preestablecida de lo que constituye un espacio vital, sin considerar la experiencia real de las personas que habitan la ciudad. Estas personas podrían señalar otros elementos que contribuyen a la vitalidad y que no pueden capturarse de manera objetiva a través de datos georreferenciados, ya sea por falta de disponibilidad de bases de datos en abierto o bien porque están relacionados con aspectos subjetivos, cualitativos y relacionales son más complejos de ser sistemáticamente cartografiados. Algunas propuestas interesantes para llevar a cabo este objetivo son metodologías cualitativas como los “Relief Maps”, una técnica innovadora que permite comprender la interrelación entre la experiencia vivida, las dinámicas de poder y los espacios (Rodó-de-Zárate, 2014).

Por ello, se ha utilizado una perspectiva cualitativa en el estudio de caso 4, empleando la metodología de la fotovoz, con el objetivo de superar parcialmente algunas de las limitaciones de la perspectiva cuantitativa. Esta aproximación permite trascender la predefinición teórica de la vitalidad urbana y otorga a las personas participantes, es decir, a quienes habitan los barrios, la capacidad de identificar los elementos que contribuyen a dicha vitalidad urbana. Gracias a esto, se han identificado aspectos específicos del diseño del espacio público, como la disposición del mobiliario y la relación entre los edificios y las calles, que influyen en la

vitalidad urbana. Además, se ha logrado comprender los significados simbólicos de ciertos espacios del barrio, los cuales generan familiaridad y seguridad en dichos entornos.

Otro aspecto relevante para la comprensión de la vitalidad urbana que revelan los resultados de este estudio es que cuando se examina la vitalidad desde la perspectiva de un grupo de población específico, se evidencia que la vitalidad no es una idea neutral. La vitalidad urbana implica presencia de actividad humana, la cual no siempre es armónica y deseable para todos. En el caso de estudio 5 de esta investigación, se seleccionó a los jóvenes como grupo de análisis, y estos señalaron, por ejemplo, que la densidad de bares, que se suele considerar como un elemento generador de vitalidad, podía limitar otras actividades en el espacio que para ellos eran importantes, como el juego. También mencionaron espacios significativos para la interacción social de los jóvenes en el barrio, como el skatepark, que resultaban molestos para algunos adultos. Estas observaciones se alinean con la idea de Lefebvre sobre la producción social del espacio público, que sostiene que dicho espacio no es simplemente un contenedor físico neutral, sino que es creado y atravesado por relaciones de poder (Lefebvre, 2013). En consecuencia, la vitalidad, entendida como el fomento del uso del espacio público, se vuelve inherentemente conflictiva.

- ***Pregunta específica 1.3***. *¿Cómo se trasladan espacialmente las condiciones de la vitalidad urbana en los contextos urbanos de las ciudades mediterráneas actuales?*

  Hipótesis 3: Las condiciones que propician la vitalidad urbana se presentan en entornos urbanos caracterizados por una variedad de estructuras morfológicas y composiciones sociales.

Los diversos estudios de caso realizados en el marco de esta tesis confirman que las ciudades mediterráneas cumplen con las condiciones teóricas descritas originalmente por Jacobs como fundamentales para el desarrollo de la vitalidad urbana. Al aplicar estas condiciones en la metrópolis de Barcelona, se evidencia que muchas de ellas son intrínsecas a la forma urbana propia de las ciudades mediterráneas, aunque estas se debilitan en entornos urbanos de desarrollos recientes en la historia.

En una ciudad mediterránea como Barcelona con una larga tradición histórica se han establecido tramas urbanas compactas, densas y con una mezcla de usos. En consecuencia, el entorno construido fomenta la actividad humana, la movilidad peatonal y la interacción social. Por lo tanto, son lugares que parten de una posición de partida favorable a la hora de abordar la vitalidad urbana, ya que no se tienen que enfrentar a los desafíos presentes en otros contextos que han experimentado un desarrollo relativamente reciente, como en las ciudades de América del Norte, América del Sur y algunas ciudades asiáticas. En dichos contextos, se requiere un esfuerzo adicional para generar densidad de población, variedad de usos urbanos y diversidad en los mismos, condiciones que en realidad son prerrequisitos para la vitalidad urbana (Fuentes et al., 2020; Jin et al., 2017; Vidal Domper et al., 2023).

En la metrópolis de Barcelona, por el contrario, se encuentran numerosos núcleos urbanos históricos con tramas compactas que constituyen enclaves privilegiados para generar vitalidad urbana. Esta metrópolis es el resultado de la unión de una amalgama de pequeños núcleos urbanos - cuya forma urbana se basa en las dinámicas de proximidad - que se integran a su vez en una ciudad de mayor escala, formando una ciudad de ciudades. Este fenómeno genera un patrón de vitalidad urbana policéntrica, donde los barrios y los subcentros urbanos adquieren una gran relevancia. Esta situación contrasta con otros contextos urbanos de diversas partes

del mundo, donde la vitalidad urbana se caracteriza por una centralidad más fuerte, con una ciudad organizada alrededor de un centro urbano que concentra una variedad de actividades, mientras que los subcentros suelen enfocarse principalmente en actividades residenciales.

Más allá de los núcleos históricos, en el proceso de expansión de la ciudad de Barcelona desarrollado a partir del siglo XIX, se construyeron tramas de ensanche, que también revela un alto potencial de vitalidad urbana. Estas áreas, en realidad, son un entramado de calles que conectan los diferentes núcleos urbanos, ocupando una posición central en la ciudad y desempeñando la función de visagra o conector. Esto las hace áreas accesibles y las aleja de los elementos debilitadores de la vitalidad, los vacíos fronterizos. Además, los desarrollos de ensanche en Barcelona se destacan por su alta densidad y su diseño que combina una diversidad de usos al reservar el espacio de las plantas bajas para actividades comerciales, asegurando así las condiciones básicas para la vitalidad urbana.

Sin embargo, en las ciudades mediterráneas también se han experimentado desarrollos urbanos en su historia reciente que han adoptado enfoques basados en teorías y prácticas funcionalistas, generando formas urbanas que rompen por completo con el modelo de ciudad compacta histórica, lo cual plantea un desafío para fomentar la vitalidad urbana. Por un lado, se han llevado a cabo desarrollos de esencia monofuncional que, según sugieren los resultados de esta tesis, representan un retroceso en términos de vitalidad, ya que rompen la escala de proximidad y dan paso a una escala mucho mayor, fomentando la movilidad motorizada. Un ejemplo de esto es la creación de áreas residenciales suburbanas, principalmente en las zonas periféricas de la ciudad. Otro ejemplo son aquellas áreas donde se han implementado proyectos urbanísticos que promueven la concentración de actividades, tanto en el centro de la trama urbana como en las áreas periféricas. Por ejemplo, se observa la concentración de actividades industriales que antes se ubicaban en las afueras y ahora se encuentran dentro de la trama urbana, así como la proliferación reciente de centros comerciales, distritos de negocios, oficinas y equipamientos culturales.

Por otro lado, también se han observado desarrollos urbanos que, pese a que parten de soluciones urbanas funcionalistas, resultan favorables para generar las condiciones de vitalidad urbana. Estos desarrollos se refieren a la construcción de bloques de vivienda masiva que surgieron como respuesta a la necesidad y escasez de viviendas en un determinado momento, con el objetivo de proporcionar rápidamente un lugar de residencia para las clases populares desplazadas hacia la periferia de la ciudad. Los resultados de esta tesis subrayan el valor de estos espacios como áreas con un alto potencial para generar vitalidad urbana. Un claro ejemplo se ha observado en algunos barrios de polígonos de viviendas en el distrito de Nou Barris, así como en otros barrios populares de los municipios conurbados.

Este hallazgo resulta interesante debido a que este tipo de desarrollo urbano, que implica proyectos masivos de viviendas públicas de alta densidad, fue objeto de críticas por parte de Jacobs e incluso se ha considerado un modelo fallido en muchos contextos urbanos, empezando por el de Estados Unidos. La falta de equipamientos y de diversidad en la composición social de los barrios, entre otros factores, llevaron a que estos fueran incapaces de generar calidad de vida, e incluso en algunos casos, se procedió a su demolición (Miller, 2008). Sin embargo, en el contexto de la metrópolis de Barcelona, se identifica que se han logrado crear las condiciones necesarias para la vitalidad urbana, gracias a una combinación de diferentes factores relativos al diseño, la aplicación de diversas políticas públicas y las redes sociales existentes.

En primer lugar, esto se debe a aspectos inherentes al propio diseño de estos barrios. Estos

presentan una alta densidad urbana, lo cual constituye la primera condición para la vitalidad urbana. Además, se ha tenido en cuenta que las plantas bajas estén destinadas a comercios y servicios, lo que asegura la presencia de usos más allá de los residenciales, cumpliendo así con otra condición esencial para la vitalidad: la combinación de usos primarios. Asimismo, la disposición de los bloques genera espacios abiertos con una baja presencia de vehículos en circulación, creando así zonas libres de automóviles propicias para fomentar las actividades en la calle y los modos de transporte activos.

En segundo lugar, el potencial de vitalidad urbana de estos barrios se explica por las políticas públicas implementadas en el contexto de la metrópolis de Barcelona a diferentes escalas administrativas de actuación, las cuales han contribuido a garantizar las condiciones del entorno construido esenciales para la vitalidad en estos barrios. Un ejemplo son aquellas centradas en mejorar la accesibilidad de estos barrios, por ejemplo, mediante la mejora de la infraestructura peatonal y el acceso a la red de transporte público. Otra muestra de estas políticas se centra en la provisión de equipamientos públicos, como los mercados municipales, que se han revelado en los resultados de esta tesis como elementos fundamentales para activar redes de proximidad vecinal, así como otras infraestructuras cotidianas como escuelas, centros cívicos y culturales.

En tercer lugar, los resultados de esta tesis también revelan la generación del potencial de vitalidad urbana en estos contextos urbanos de bloques de vivienda de alta densidad - aunque no exclusivamente en ellos - a través de elementos inmateriales que contribuyen a promover dinámicas de proximidad. Estos hallazgos se suman a una línea de investigación reciente que explora la relación entre los entornos vitales y las dinámicas de cohesión social. Algunos de estudios sugieren que en entornos que presentan las características propias de la vitalidad urbana, como una alta densidad y la presencia de comercios y servicios, puede existir una menor cohesión social (Madrid-Solorza et al., 2023; Mouratidis & Poortinga, 2020). Por su parte, según los resultados obtenidos mediante el análisis cualitativo, una de las claves para la vitalidad urbana reside en que en los barrios se establezcan relaciones de familiaridad y confianza. Estas se desarrollan a través de espacios de socialización y de infraestructuras cotidianas específicas presentes en el entorno construido, y por la existencia de un equilibrio en la composición social de los barrios que garantice una cierta estabilidad en la población residente.

Tomando en cuenta todo lo expuesto previamente, esto nos lleva a una idea fundamental de la tesis y a la afirmación de la hipótesis planteada: la vitalidad urbana no está necesariamente asociada con la centralidad o un diseño urbano específico. En el caso de la metrópolis de Barcelona, hemos observado cómo se desarrollan escenarios con características sociomorfológicas heterogéneas que, al combinar diferentes dimensiones de la vitalidad, como la densidad, la diversidad y la accesibilidad, exhiben un elevado potencial de vitalidad urbana.

Pregunta 2: ¿De qué manera interactúan los principios de la vitalidad urbana con las dinámicas cotidianas y los procesos sociales de las ciudades contemporáneas, considerando la perspectiva de la sostenibilidad, la justicia social y el género?

- ***Pregunta específica 2.1***. *¿Cuál es la relación entre las condiciones de vitalidad urbana y los procesos característicos de la ciudad global mediterránea, como el aumento de las desigualdades sociales intraurbanas y la presión turística?*

Hipótesis 4: La vitalidad se da en entornos socialmente privilegiados.

Hipótesis 5: La vitalidad urbana convive con dinámicas de exclusión social perjudiciales para la vida cotidiana de los barrios como la alta presión turística.

Esta pregunta de investigación plantea dos hipótesis fundamentales. La primera sostiene que la vitalidad se produce en entornos socialmente privilegiados. En el contexto de la metrópolis de Barcelona, se rechaza esta hipótesis. Se observa que la vitalidad puede manifestarse en una amplia variedad de entornos urbanos, tal como se ha mostrado anteriormente, con diferentes formas y tramas, pero también, con características sociodemográficas diversas. Así, vemos que existen barrios acomodados con niveles bajos de vitalidad, sobre todo, por ejemplo, en tejidos residenciales ubicados principalmente en las periferias urbanas. Y a la vez, en barrios socialmente vulnerables se aprecia un gran potencial de vitalidad urbana, sobre todo en barrios con altas densidades, conectados al transporte público. Estas evidencias cuestionan las afirmaciones de algunos autores que establecen una relación directa entre características urbanas propias de los entornos vitales y la exclusiva presencia de población acomodada en dichos espacios (Steil & Delgado, 2018; van den Berg, 2018).

La segunda hipótesis plantea que la vitalidad urbana convive con dinámicas de exclusión social. Los resultados de la tesis confirman esta hipótesis, ya que revelan que a nivel local existen escenarios donde se dan las condiciones propicias para la vitalidad y al mismo tiempo coexisten con situaciones de vulnerabilidad social y presión turística que afectan negativamente a la cotidianidad de los barrios. Es importante que esta tesis haya dado a conocer esta relación ya que pone de manifiesto una situación paradójica. El entorno construido, cuando es vital, a priori es un indicador de calidad y es una herramienta democratización del bienestar y la salud pública, ya que implica que los barrios sean caminables, están bien equipados de servicios y ofrezcan las condiciones para que se tejan redes comunitarias (Braun & Malizia, 2015; Marquet & Miralles-Guasch, 2016). Esto se vuelve especialmente relevante en aquellos contextos con población socialmente desfavorecida, ya que el entorno es un capital añadido que produce calidad de vida. No obstante, estos entornos más vitales también son más atractivos, y algunos autores han explicado, a través de fenómenos como la gentrificación verde, cómo en ciudades globales, la mejora de los entornos urbanos a menudo conlleva a un aumento en el valor del suelo, provocando el desplazamiento de residentes de bajos ingresos (Stein, 2019, p. 29). En lo que respecta específicamente a la presión turística, los resultados del estudio de caso 3 indican que en los entornos donde la vitalidad coexiste con altos niveles de presión turística, la diversidad de actividades se ve amenazada. Se observa que en el paisaje comercial prevalece una proporción significativa de actividades dirigidas a satisfacer las necesidades de la población visitante, lo cual conlleva una disminución de la propia vitalidad.

- **Pregunta específica 2.2**. *¿En qué medida las condiciones de vitalidad urbana influyen en la promoción de la sostenibilidad de la vida y la provisión de cuidados en los entornos urbanos?*

Hipótesis 5: Las condiciones de la vitalidad urbana sustentan y apoyan la satisfacción de las necesidades de cuidado.

Tras llevar a cabo los distintos estudios de caso, es posible confirmar parcialmente la hipótesis planteada. Esta afirmación se respalda, en primer lugar, por los resultados obtenidos en el estudio de caso 5, que analiza los viajes realizados diariamente para satisfacer las necesidades de cuidado en relación con las características territoriales. Los hallazgos de dicho estudio revelan que en áreas donde prevalecen las condiciones de vitalidad urbana, es decir, áreas

más densas y compactas, se fomentan los desplazamientos para el cuidado utilizando medios de transporte activos. Por consiguiente, la movilidad relacionada con el cuidado en el contexto de la metrópolis de Barcelona está vinculada a entornos cercanos, ya que la mayoría de estos viajes de cuidado se realizan caminando, a diferencia de otros entornos urbanos donde el uso del automóvil es más común debido a un desarrollo urbano más disperso y una mayor dependencia del vehículo privado (Ravensbergen et al., 2022a). Los entornos vitales promueven prácticas de cuidado más sostenibles desde una perspectiva ambiental, y a la vez promueven mayor equidad social. Se ha evidenciado que en entornos donde se dan condiciones de vitalidad, se realizan menos viajes de acompañamiento a otras personas, lo que implica una mayor autonomía en los desplazamientos y una menor dependencia de la presencia de una persona cuidadora que brinde acompañamiento, lo que a su vez libera tiempo para las personas cuidadoras, que suelen ser mujeres.

Otra forma de comprender la relación entre los entornos vitales y la satisfacción de las necesidades de cuidado se ha estudiado a través de la diversidad de actividades en el caso de estudio 3. En general, se observa que los entornos vitales son lugares bien equipados con servicios, establecimientos y centros cívicos, que cuentan con la infraestructura cotidiana necesaria para satisfacer las necesidades reproductivas, como negocios de alimentación y servicios básicos como salud y educación. Sin embargo, al relacionar espacialmente estos espacios con la vulnerabilidad y la actividad turística, se constata, por un lado, la existencia de lugares con alta presión turística donde, a pesar de tener un gran potencial de vitalidad urbana, la provisión de infraestructura cotidiana es menor. Por otro lado, en lugares con altos niveles de vulnerabilidad, la mayoría de las actividades comerciales se centran en la provisión básica de alimentos, pero existe una menor accesibilidad a actividades recreativas y de ocio. Según los testimonios recogidos en el estudio de caso 5, el acceso al ocio en el vecindario desempeña un papel crucial en la generación de dinámicas de proximidad y la formación de vínculos identitarios, los cuales son relevantes para establecer una red de apoyo cercana que contribuye al cuidado de las personas. Además, se destacan lugares significativos donde se llevan a cabo estas actividades recreativas, que trascienden el mero consumo en establecimientos, como equipamientos cívicos y espacios públicos equipados con mobiliario urbano que promueve la permanencia y el descanso en el entorno.

10.2. Conclusiones generales

Esta tesis tiene como objetivo estudiar el concepto teórico de la vitalidad urbana de manera aplicada, en el contexto de la metrópolis de Barcelona y desde una óptica contemporánea. En este apartado se presentan las conclusiones generales de la tesis, derivadas de la exhaustiva discusión de los resultados realizada en el capítulo anterior. Estas conclusiones se presentan de manera sintética, en forma de puntos clave:

- **La vitalidad urbana en la metrópolis de Barcelona se caracteriza por un patrón policéntrico, abarcando diversas formas urbanas y contextos sociodemográficos**. Los resultados de esta investigación siguen el camino trazado por el estudio pionero de Delclòs-Alió et al. (2018), que previamente reveló la estructura policéntrica de la vitalidad en la ciudad de Barcelona. Sin embargo, las evidencias de esta investigación van más allá al examinar las condiciones de vitalidad urbana desde una perspectiva contemporánea y a escala metropolitana. Esto revela que la vitalidad se manifiesta en una amplia variedad de tramas urbanas, incluso en aquellas menos exploradas y predecibles, como los desarrollos periféricos con polígonos de vivienda en altura de alta densidad. Por el contrario, los desarrollos urbanísticos funcionalistas de gran escala que se han llevado a cabo en las últimas décadas, caracterizados por la predominancia de la monofuncionalidad y la dependencia del vehículo privado, no logran generar vitalidad urbana. Además, también se ha demostrado que la vitalidad urbana no está exclusivamente relacionada con un tipo específico de población, en contraste con algunas teorías existentes. Los resultados en la metrópolis de Barcelona indican que la vitalidad se encuentra en diversos contextos sociodemográficos y no está restringida a áreas exclusivas para la población socialmente privilegiada.

- **La vitalidad urbana es el resultado de diversas combinaciones de condiciones favorables.** Esta afirmación se respalda en la conclusión previa, donde se evidenció que se manifiesta en una variedad de contextos urbanos, siendo el producto de la interacción de diferentes elementos. Para evaluarla adecuadamente, es necesario considerar la compleja relación entre estas condiciones. No existe una fórmula única para generar vitalidad, ya que las circunstancias varían considerablemente. En algunos barrios, se da de forma inherente debido a su estructura y desarrollo histórico, como los núcleos urbanos tradicionales y los barrios centrales. Sin embargo, en áreas periféricas, se requiere una intervención deliberada, como políticas públicas que promuevan el bienestar, el acceso a servicios y equipamientos locales, así como una conexión eficiente con el transporte público. Por tanto, la vitalidad urbana se logra mediante la combinación óptima de condiciones, entre las cuales son fundamentales la densidad, la diversidad y la accesibilidad.

- **Las condiciones teóricas para la vitalidad urbana, per se, no son una fuente de bienestar garantizada.** En términos generales se asume que aquellos entornos que reúnen las condiciones para la vitalidad urbana garantizaran a su vez ciertos niveles de bienestar, ya que fomentan el uso activo de calles y barrios, y resultan en ciudades más sostenibles, resilientes y justas. Sin embargo, esta tesis demuestra que la vitalidad coexiste con dinámicas como la desigualdad social y la presión turística, lo que significa que los lugares vitales no siempre se traducen en bienestar. Además, al analizar la vitalidad desde una perspectiva cualitativa, se evidencia que el uso de espacios públicos puede generar conflictos. La vitalidad no es pues una cualidad neutra y armónica, sino que implica disputas en torno al uso del espacio. Lo que genera bienestar para algunos puede afectar

el bienestar de otros.

- **Existen matices geográficos, temporales y relacionados con la subjetividad en el análisis actualizado de la vitalidad urbana.** El estudio académico de la vitalidad urbana se centra mayoritariamente en examinar las características físicas y sociales necesarias en las ciudades para fomentar la actividad humana. A menudo se considera que las condiciones para la vitalidad, como la densidad, diversidad y accesibilidad, por sí solas tienen un impacto positivo en la promoción del bienestar. Sin embargo, teniendo en cuenta la conclusión anterior, un análisis que se aborde desde la geografía mediterránea y una visión contemporánea, nuestros análisis sobre vitalidad urbana no deben quedarse en la mera descripción de estas condiciones, si no que se concluye que, si bien estas ofrecen a priori las condiciones físicas para generar entornos con mayor calidad de vida, tienen que analizarse en relación a otras variables relevantes para el contexto de estudio. Por ejemplo, la densidad juega un papel fundamental en la generación de dinámicas de proximidad en diversos contextos urbanos, especialmente aquellos con una distribución dispersa. Sin embargo, en la metrópolis de Barcelona, donde la densidad está intrínsecamente ligada al diseño urbano, resulta insuficiente limitarse a medir únicamente la densidad para comprender la vitalidad de la ciudad. Es necesario dar un paso más allá y analizar los matices de la vitalidad urbana, comprendiendo cómo se crean espacios propicios para la vida cotidiana. Para lograr esto, es crucial entender la relación entre las condiciones de vitalidad y los fenómenos contemporáneos, empleando distintas metodologías en el proceso.

10.3. General conclusions (English)

This thesis aims to study the theoretical concept of urban vitality in an applied manner, within the context of the metropolis of Barcelona and from a contemporary perspective. This section presents the general conclusions of the thesis, derived from the exhaustive discussion of the results presented in the previous chapter. These conclusions are presented synthetically in the form of key points:

- **Urban vitality in the metropolis of Barcelona is characterized by a polycentric pattern, encompassing diverse urban forms and sociodemographic contexts.** The findings of this research follow the path traced by the pioneering study of Delclòs-Alió et al. (2018), which previously revealed the polycentric structure of vitality in the city of Barcelona. However, the evidence from this research goes further by examining the conditions of urban vitality from a contemporary and metropolitan scale perspective. This reveals that the potential of urban vitality is present in a wide variety of urban settings, even in less explored and predictable areas, such as peripheral developments with large-scale housing blocks. On the contrary, large-scale functionalist urban developments carried out in recent decades, characterized by the predominance of monofunctionality and dependence on private vehicles, fail to generate potential of urban vitality. Furthermore, it has also been demonstrated that urban vitality is not exclusively related to a specific type of population, in contrast to some existing theories. The results in the metropolis of Barcelona indicate that vitality is found in various sociodemographic contexts and is not restricted to areas exclusive to socially privileged populations.

- **Urban vitality is the result of various combinations of favorable conditions.** This assertion is supported by the previous conclusion, where it was evidenced that the potential of urban vitality is manifested in a variety of urban contexts, being the product of the interaction of different elements. In order to properly evaluate it, it is necessary to consider the complex relationship between these conditions. There is no single formula to generate vitality, as it is produced within circumstances that vary considerably. In some neighborhoods, vitality occurs inherently due to their urban form, location and historical development, such as traditional urban cores and central neighborhoods. However, in peripheral areas, deliberate intervention is required, such as public policies that promote well-being, access to local services and facilities, as well as efficient connectivity with public transportation. Therefore, urban vitality is achieved through the optimal combination of conditions, among which density, diversity, and accessibility are fundamental.

- **The theoretical conditions for urban vitality, per se, are not a guaranteed source of well-being**. In general terms, it is taken-for-granted that environments that meet the conditions for urban vitality will guarantee certain levels of well-being, as they promote active use of streets and neighborhoods, resulting in more sustainable, resilient, and just cities. However, this thesis demonstrates that vitality coexists with dynamics such as social inequality and touristic pressure, meaning that vital places do not always translate into well-being. Additionally, when analyzing vitality from a qualitative perspective, it is evident that the use of public spaces can generate conflicts. Vitality is not a neutral and harmonious quality; it involves disputes over the use of space, as what generates well-being for some may affect the well-being of others.

- **There are geographical, temporal, and subjective nuances in the updated analysis of urban vitality.** The academic study of urban vitality primarily focuses on examining the physical and social characteristics necessary in cities to promote human activity. Conditions for vitality, such as density, diversity, and accessibility, are often considered to have a positive impact on promoting well-being by themselves. However, considering the previous conclusion, an analysis that approaches urban vitality from the Mediterranean geography and a contemporary vision should not limit itself to solely describing these conditions. Instead, it is concluded that while these conditions offer a priori the physical requirements for generating environments with a higher quality of life, they must be analyzed in relation to other relevant variables for the context of the study. For example, density plays a fundamental role in generating proximity dynamics in various urban contexts, especially those with a dispersed distribution. However, in the metropolis of Barcelona, where density is intrinsically linked to urban design, it is insufficient to only measure density to understand the vitality of the city. It is necessary to go beyond and analyze the nuances of urban vitality, understanding how spaces conducive to everyday life are created. To achieve this, it is crucial to understand the relationship between vitality conditions and contemporary phenomena, employing different methodologies in the process.

Capítulo 11

Reflexiones finales

11.1. Fortalezas, limitaciones y perspectivas de investigación futura de la tesis

Esta tesis doctoral presenta diversas potencialidades que refuerzan su relevancia e impacto en el campo de estudio. En primer lugar, cabe destacar el desarrollo del índice JANE actualizado, el cual añade complejidad al enfoque previo de Delclòs-Alió et al. (2018). Este índice ha revisitado las condiciones de vitalidad desde una perspectiva contemporánea, operativizando hasta 22 variables del entorno construido mediante la utilización de nuevas fuentes de información de datos georreferenciados disponibles. Esta contribución es relevante por tres razones fundamentales. En primer lugar, establece un marco metodológico replicable que ha permitido a otros investigadores determinar el potencial de los espacios urbanos para ser vitales en diferentes contextos (L. Chen et al., 2022; Y. Chen et al., 2023; Huang et al., 2022, 2022; Liu et al., 2022, 2022; Y. Shi et al., 2023; Vidal Domper et al., 2023; S. Wang et al., 2022; Z. Wang et al., 2023; Wangbao, 2022; Yu et al., 2022; X. Zhang et al., 2022). De este modo, se ha contribuido recientemente a ampliar la discusión sobre la vitalidad de manera global mediante esta herramienta metodológica. En segundo lugar, este índice puede servir también como una herramienta para la formulación de políticas urbanas (Higgs et al., 2022; Jiménez-Espada et al., 2023), ya que facilita la identificación de lugares con mejores o peores condiciones para fomentar la vitalidad, así como las dimensiones específicas que requieren mejoras. Y en tercer lugar, este marco de análisis permite establecer relaciones entre la vitalidad y otros fenómenos, tal como se ha demostrado en otros dos estudios de caso de la tesis.

Esta última contribución constituye otra de las potencialidades de la tesis, el hecho de que va más allá del análisis aislado de las condiciones de vitalidad, como es habitual en la mayoría de la literatura existente en este campo de investigación. Se ha realizado un esfuerzo por relacionar la vitalidad urbana, el potencial del entorno físico, con las dinámicas sociales relevantes en los debates urbanos actuales, como la vulnerabilidad social, el turismo y la movilidad desde una perspectiva de género. Esto se alinea con los estudios incipientes de esta línea de investigación que trascienden el mero análisis de las condiciones de vitalidad desde el componente físico, y que buscan establecer vínculos con cuestiones importantes para la sostenibilidad de la vida cotidiana en las ciudades, como la cohesión social (Madrid-Solorza et al., 2023; Mouratidis & Poortinga, 2020) o los estilos de vida activos (Lai et al., 2022).

Asimismo, se destaca como fortaleza de la tesis la metodología planteada, que ha empleado una variedad de técnicas y escalas para analizar la vitalidad urbana. Se han aprovechado las herramientas de análisis geográfico, tanto cuantitativas, mediante el uso de datos georreferenciados de alta resolución, como cualitativas, mediante metodologías innovadoras que permiten comprender las experiencias. Esto ha permitido detectar matices de la vitalidad y comprender el concepto desde una perspectiva geográfica tanto objetiva como subjetiva. Al

adoptar diferentes enfoques para estudiar la vitalidad urbana, se ha desafiado la suposición comúnmente aceptada de que las condiciones la vitalidad deben promoverse de manera indiscriminada para mejorar el bienestar. Este análisis más matizado ha generado nuevas interrogantes y ha señalado la necesidad de repensar estas condiciones, como por ejemplo, la diversidad o la densidad. Es fundamental comprender cómo estas se traducen en la experiencia diaria de habitar los barrios, lo que plantea importantes líneas de investigación futura.

En la cuestión metodológica destaca también el uso de la técnica fotovoz ya que resulta un enfoque innovador en el ámbito de estudio. La fotografía ha demostrado poseer un gran potencial para iniciar la reflexión sobre la vitalidad urbana entre aquellos colectivos menos familiarizados con los debates urbanos. Además, el enfoque del fotovoz permite dirigir la atención hacia aspectos micro del diseño urbano, brindando la oportunidad de comprender aspectos intangibles como las emociones y las percepciones asociadas a los espacios. Asimismo, se abre la posibilidad de explorar cómo estos espacios son utilizados, a veces incluso más allá de sus usos "oficiales" o previstos. También este enfoque ha resultado esencial para hacer emerger las relaciones de poder en el espacio público y entender cómo ciertos usos pueden conllevar al conflicto. Esta línea de investigación plantea una interesante dirección para el futuro, ya que se requieren más evaluaciones cualitativas en el análisis de la vitalidad urbana, que, hasta la fecha, este campo de investigación ha sido predominantemente cuantitativo. Explorar el potencial del fotovoz ampliando los grupos de discusión a más participantes, o utilizar otros enfoques cualitativos puede enriquecer aún más nuestro entendimiento de la vitalidad urbana y complementar los enfoques existentes basados en datos cuantitativos.

A pesar de las contribuciones significativas realizadas en esta tesis, también es importante identificar las limitaciones con el fin de informar a futuros estudios. En primer lugar, con respecto a la construcción del índice JANE, cabe mencionar que existen limitaciones inherentes a la creación de un índice sintético basado en la combinación de ponderaciones específicas. Aunque dichas ponderaciones se fundamentan en criterios respaldados por la literatura existente, es posible que otros autores planteen discusiones, especialmente al intentar aplicar esta metodología en contextos diferentes donde las variables podrían tener un peso distinto en la generación de la vitalidad.

Otra limitación de esta tesis radica en su enfoque mayoritariamente estático de la vitalidad. Los datos utilizados para operativizar las distintas dimensiones de la vitalidad capturan una "foto fija" de su estado. Sin embargo, es necesario explorar una perspectiva más dinámica, que analice cómo los espacios urbanos son ocupados y utilizados de manera diferente a lo largo del día y por diversos grupos sociales. Desde una perspectiva cuantitativa, ya existen investigaciones adicionales que han sido publicadas simultáneamente a esta tesis y que buscan abordar esta cuestión mediante el uso de datos que permiten comprender las fluctuaciones temporales de la vitalidad, así como la diferenciación entre distintos tipos de vitalidad, como la cultural, económica y social (P. Zhang et al., 2023). Para ello, resulta útil emplear datos provenientes de la telefonía móvil (Gao et al., 2023; Lv et al., 2022), las redes sociales (Lu et al., 2019) o los patrones de movilidad (C. Kang et al., 2020). También sería interesante comprender las variaciones temporales de la relación entre la vitalidad con las dinámicas sociales estudiadas, la vulnerabilidad social y la presión turística, a partir de estudios longitudinales que permitieran ver su evolución. Resultaría igualmente de interés explorar las fluctuaciones temporales en la interacción entre la vitalidad y las dinámicas sociales analizadas. Esto podría lograrse mediante la realización de estudios longitudinales que permitieran entender la evolución de la relación entre la vitalidad y la vulnerabilidad social y/o la presión turística a lo largo del tiempo.

Asimismo, al examinar la diversidad de actividades a través de la red comercial y los equipamientos, se están considerando únicamente las actividades formales y registradas, limitándose a categorías específicas. Sin embargo, no se tiene en cuenta ni las actividades que tienen lugar en el espacio público, ni los aspectos cualitativos asociados a dichas categorías. Por ejemplo, se conoce el tipo de actividad económica, como el comercio de alimentos, pero no se tiene información sobre las interacciones específicas que se establecen con la población. En este sentido, resulta relevante para el estudio de la vitalidad urbana trascender del estudio de la proximidad a partir de la mera ubicación geográfica de los comercios y abordar la proximidad desde una perspectiva cualitativa que permita comprender las relaciones de familiaridad establecidas (Fresnillo, 2018). Además, este enfoque también resulta pertinente en términos de género, ya que podría revelar la existencia o ausencia de redes de apoyo para el cuidado a través de las infraestructuras cotidianas, como la red comercial de proximidad.

En relación con la perspectiva cualitativa empleada en el estudio del fotovoz, es importante destacar que su valor radica más en su contribución metodológica que en los resultados obtenidos. Es necesario reconocer que existen limitaciones en cuanto a la generalización de los hallazgos, lo cual constituye el principal desafío de esta técnica, además de que requiere una gran inversión de tiempo tanto para los investigadores como para los participantes. Asimismo, otra limitación del estudio se ha manifestado en el impacto posterior dentro del marco de la Investigación-Acción Participativa, y en la escasa efectividad del cambio en la realidad social investigada. Se reconoce que esta ha sido una primera incursión en esta metodología de investigación y que estas limitaciones deberán superarse en futuros trabajos. Por tanto, se plantea la necesidad de ampliar la muestra, comparar las experiencias en entornos con diferentes niveles de vitalidad potencial, explorar diferentes grupos de estudio y vincular la investigación con la formulación de políticas.

11.2. Implicaciones para la formulación de políticas urbanas

Finalmente, de acuerdo con los hallazgos obtenidos en esta tesis doctoral, es posible destacar las implicaciones relevantes que surgen para la formulación de políticas urbanas en el ámbito de la vitalidad urbana. En el contexto mediterráneo, se ha observado que la vitalidad es generalmente inherente a la forma urbana debido a los altos niveles de densidad y diversidad presentes en una gran variedad de entornos urbanos. Esto contrasta con las realidades de otros contextos donde la dispersión urbana es mayor y/o existe una gran monofuncionalidad. En estas circunstancias, los esfuerzos de las políticas públicas para fomentar la vitalidad urbana se centran en generar las condiciones del entorno construido para promoverla. Por ejemplo, a través de políticas de densificación (Canesi, 2022; J. Chen et al., 2023; Giddings & Rogerson, 2021; Touati-Morel, 2015) o la creación de centros urbanos donde se concentran una diversidad de actividades mediante iniciativas como los "barrios de los 20 minutos" (Chau et al., 2022; Jafari et al., 2023). En cambio, estas políticas en el contexto de la metrópolis de Barcelona no son pertinentes debido a las particularidades del contexto. Los resultados de la tesis identifican subcentros de vitalidad urbana en un esquema policéntrico que, de hecho, ya coinciden con los espacios donde las necesidades cotidianas se pueden satisfacer en un máximo de aproximadamente 15 minutos (Ferrer-Ortiz et al., 2022). Por lo tanto, las políticas urbanas en Barcelona deben ser tomar otras direcciones.

En términos generales, este estudio señala dos direcciones principales que las políticas urbanas deben seguir. Por un lado, es necesario trabajar para promover la vitalidad en

lugares con un bajo potencial. Se han identificado escenarios donde las condiciones para la vitalidad están presentes y es importante aprender de ellos. Se debe abandonar la lógica de monofuncionalidad de los proyectos urbanísticos recientes que no han demostrado promover las condiciones para la vitalidad, como el 22@, el Fòrum o la Fira-Plaça Europa. En su lugar, cabe apostar por formas urbanas que fomenten la actividad en la calle tomando el ejemplo de las múltiples fórmulas existentes, pues se ha comprobado que la vitalidad urbana no depende de una combinación única de condiciones, sino que existen diversas combinaciones posibles. Un ejemplo exitoso son las políticas urbanas implementadas en barrios periféricos, donde inicialmente parecía más difícil generar vitalidad debido a las dificultades del entorno y el aislamiento. Sin embargo, al conectar estos barrios y proporcionarles una diversidad de servicios, se crean las condiciones necesarias para la vitalidad. Estos resultados se reflejan en los hallazgos de esta investigación, que destacan espacios urbanos como los proyectos de viviendas en altura, donde una planificación adecuada en términos de densidad, diversidad, espacios de encuentro y conexión con el transporte público favorece la vitalidad.

Por otro lado, en los lugares donde la vitalidad ya está presente, es importante asegurarse de que esta no sea excluyente y permita el desarrollo de la vida cotidiana, evitando que dichos lugares “mueran de éxito”. Se han identificado escenarios en los que la vitalidad coexiste con lógicas de desigualdad, donde hay población vulnerable. La conjunción de estas realidades puede propiciar la aparición de dinámicas de exclusión social, como la gentrificación o la turistificación de los barrios. Así, estos hallazgos conectan con los debates actuales que tienen lugar en la ciudad, donde las políticas urbanas locales que promueven las condiciones para la vitalidad (intervenciones de calmado del tráfico, accesibilidad peatonal, construcción de infraestructuras, entre otras) a veces se perciben como una amenaza para los barrios, debido a dinámicas globales. Sin embargo, esto no significa que las ciudades deban dejar de planificar para la vitalidad. En su lugar, es necesario pensar en cómo promover la vitalidad con una perspectiva de justicia, tal como sugieren algunos autores (Anguelovski et al., 2023; Connolly, 2018).

Algunas medidas políticas podrían enfocarse en democratizar el acceso a los espacios vitales, extendiendo estas condiciones de manera equitativa en toda la ciudad metropolitana y evitando la competencia por dichos espacios. Otras políticas demandadas por organismos sociales se centran en el ámbito de la vivienda, con el objetivo de evitar la creación de enclaves exclusivos de población extranjera que expulsen a la población residente en los barrios (Cocola-Gant & Lopez-Gay, 2020). Tal como se evidencia en los resultados de la tesis, esta situación puede ocasionar la pérdida de diversidad de actividades, lo cual constituye actualmente una de las preocupaciones en el debate público. Algunos actores sociales argumentan que para evitar tales escenarios, sería necesario fomentar el acceso asequible a la vivienda y regular las actividades turísticas y el alquiler de corta duración (Delclós et al., 2023). Asimismo, la regulación de los usos urbanos podría ser otra herramienta política para fomentar la diversidad de actividades en áreas con escasez de servicios, especialmente en entornos vulnerables donde la falta de opciones de ocio es evidente. Además, esta regulación puede salvaguardar la diversidad en lugares que experimentan una alta presión debido al turismo.

PARTE VI:

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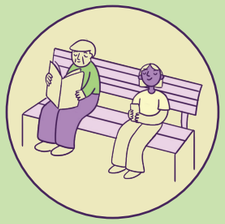

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PARTE VII:

ANEXO

Capítulo 12

Actividades realizadas durante el periodo de tesis

Como se expone en el Prefacio de esta publicación, la realización de esta tesis doctoral ha sido principalmente posible gracias a la financiación otorgada por el Ministerio de Ciencia, Innovación y Universidades del Gobierno de España a través de la ayuda "Formación de Profesorado Universitario (FPU)" con código FPU18/02129. Durante el periodo de cuatro años en que se disfrutó de esta beca, la doctoranda llevó a cabo el trabajo presentado en este compendio de publicaciones, así como otras actividades en paralelo. Estas actividades abarcan la difusión de los resultados de la tesis en congresos, conferencias y charlas, participación en actividades de formación y docencia académica, estancias de investigación en centros de investigación extranjeros y la publicación de otros trabajos académicos relacionados con la actividad investigadora del Grupo de Estudios en Movilidad, Transporte y Territorio (GEMOTT). A continuación, se detallan estas actividades.

12.1. Difusión de los resultados de la tesis

Presentaciones en congresos de ámbito nacional e internacional

1. **Gómez-Varo, I.**, Delclòs-Alió, X., Miralles-Guasch, C., & Marquet, O. "Spatial distribution of retail diversity in relation to social vulnerability and touristic uses. The case of Barcelona." *9º Congreso de la Association of European Geographical Societies (EUGEO), Geografía para nuestro futuro común*. Barcelona (España), del 4 al 7 de setiembre de 2023.

2. **Gómez-Varo, I.** "Vitalidad y vulnerabilidad urbana: Explorando la relación espacial de dos dinámicas en tensión en la metrópolis de Barcelona". *VIII Congrés Català Internacional de Sociologia, Construint Equitat i Futurs Sostenibles*. Barcelona (España), del 12 al 14 de julio de 2023.

3. **Gómez-Varo, I.**, Marquet, O, Delclòs-Alió, X. & Miralles-Guasch, C. "Are vital neighbourhoods socially-privileged? Exploring the spatial relationship between urban vitality and urban vulnerability." *Urban transitions 2022, Integrating Urban and Transport Planning, Environment and Health for Healthier Urban Living.* Sitges (Barcelona, España), del 8 al 10 de noviembre de 2022.

4. **Gómez-Varo, I.**, Delclòs-Alió, X., Miralles-Guasch, C., & Marquet, O. "What makes our neighbourhood liveable? A photovoice project with young people in a peripheral low-income district of Barcelona". *Union Géographique Internationale UGI Paris 2022, Le Congrès du Centennaire, Le temps des Géographes.* París (Francia), del 18 al 22 de julio de 2022.

5. **Gómez-Varo, I.**, Delclòs-Alió, X., Miralles-Guasch, C., & Marquet, O. "Mobility of care in the Mediterranean city: assessing care-related trips and their sociospatial correlates". *Union*

Géographique Internationale UGI Paris 2022, Le Congrès du Centennaire, Le temps des Géographes. París (Francia), del 18 al 22 de julio de 2022.

6. **Gómez-Varo, I.**, Delclòs-Alió, X. & Miralles-Guasch, C. "Revisitando a Jane Jacobs en Nou Barris, Barcelona. Desarrollo de un índice sintético para analizar la vitalidad urbana". *XXVII Congreso de la Asociación Española de Geografía, Geografía, Cambio Global y Sostenibilidad.* La Laguna (Tenerife, España), del 14 al 17 de diciembre de 2021.

7. **Gómez-Varo, I.**, Delclòs-Alió, X. & Miralles-Guasch, C. "Vitalidad urbana y vida cotidiana: revisitando a Jane Jacobs desde el análisis espacial del comercio alimentario en Barcelona. *13th International Conference Virtual City and Territory.* Barcelona (España), del 2 al 4 de octubre de 2019.

Charlas y presentaciones relacionadas con la tesis

1. Tertúlia "**Mirades a la Barcelona Contemporània des de la literatura i l'urbanisme**". Ciclo de tertúlies del Cafè Continental del Ateneu Barcelonès. Barcelona, 25 de mayo de 2023.

2. Ponencia "**Revisiting Jane Jacobs from a contemporary and applied perspective: the JANE index on urban vitality**" Centre for Urban Research Seminar Series de la RMIT University en Melbourne (Australia), 11 de abril de 2023.

3. Ponencia "**Proyecto fotovoz: en búsqueda de los espacios vitales en Nou Barris (Barcelona)**", en el marco de la asignatura Técnicas Cualitativas para la Planificación Territorial del Máster interuniversitario en Planificación, Gobernanza y Liderazgo Territorial de la Universitat Rovira i Virgili. 1 de marzo de 2023 y 4 de marzo de 2022.

4. Ponencia "**La vitalitat urbana a la Ciutat de Barcelona**". Participación en la Comisión no permanente del estudio sobre el modelo urbano de la ciudad de Barcelona, Ayuntamiento de Barcelona. Barcelona, 4 de mayo de 2022. Disponible en: https://www.youtube.com/watch?v=aUPdwQpwq4c

5. Ponencia "**Aproximación a la medición de la movilidad del cuidado a través de encuestas estándar de transporte. Un estudio de caso de la Región Metropolitana de Barcelona**" en el curso "La Movilidad del cuidado: el reto para un transporte más igualitario" organizado por la Edición de Cursos de Verano de 2022 de la Universidad del País Vasco. San Sebastián, 12 de setiembre de 2022.

6. Episodio "**19: Jane Jacobs Reloaded: Contemporary Urban Vitality in Barcelona**" del Podcast "**Dense City Podcast**", dirigido por Rebecca Mayers e Isaac Keast. Noviembre de 2022. Disponible en: https://open.spotify.com/episode/0gYqLvsFko5mELEBFpWYyD

7. Ponencia "**Revisitando a Jane Jacobs: Barcelona y Santiago de Chile**", del Workshop Internacional "Metrópolis en movimiento. Barcelona y Santiago de Chile" en el Institut de Ciència i Tecnologia Ambientals (ICTA-UAB). Bellatera, 7 de julio de 2022.

8. Ponencia Tedx Talk "**Jane Jacobs y la vitalidad urbana en Barcelona**", organizada por Tedx Barcelona Salón en Casa Seat. Barcelona, 1 de julio de 2021. Disponible en: https://www.youtube.com/watch?v=JKxny_0GZwI&t=33s

9. Webinar "**La mobilitat del futur post-pandèmia: cap a la sostenibilitat ambiental i social**", en la XI edición de la Setmana Saludable i Sostenible de la UAB, 15 de abril de 2021.

12.2. Formación

Asistencia a Congresos y seminarios de interés

- **IV Congrés "El transport públic és cosa de dones?"**. Organizado por Promoció del Tranport Públic, Diputació de Barcelona, AMB, IERMB, Ajuntament de Barcelona, Renfe i Col·lectiu Punt 6. Barcelona, 30 de marzo del 2022.

- **II Congrés "El transport públic és cosa de dones?"**. Organizado por Promoció del Tranport Públic, Diputació de Barcelona, AMB, IERMB, Ajuntament de Barcelona, Renfe i Col·lectiu Punt 6. Barcelona, 11 de marzo del 2020.

- **Webinar "Movilidad del cuidado en tiempos de COVID-19"**. Organizado por Red de Mujeres en Movimiento. Online, 24 de junio de 2020.

Actividades de formación

- **ECSR Spring School 2022 "Geography, Mobility and Social Stratification"**. – Organizado por el European Consortium for Sociological Research, la Università Degli Studio di Milano y la Università di Torino. Turín (Italia), del 21 al 25 de marzo de 2022.

- **Introducción a R** (10 horas) - Organizado por el Programa de Doctorado en Turismo de la UAB. Bellaterra (Barcelona, España), el 22 de febrero, 8 y 15 de marzo de 2022.

- **Participatory methods to support institutional change for Gender Equality in research organisations** (6.5 horas) – Organizado por Gender Equality Academy. Online, el 16 y 18 de diciembre de 2020.

- **Estrategias Metodológicas para Territorialidades Enmarañadas** (135 horas) – Organizado por Núcleo Milenio Movilidades y Territorios (MOVYT) en conjunto con Contested Territories, el Centro de Estudios de Conflicto y Cohesión Social y el Programa de Doctorado en Territorio, Espacio y Sociedad de la Universidad de Chile. Online, del 3 al 27 de noviembre de 2020.

- Curso **10 anys de l'Àrea Metropolitana de Barcelona: balanç i reptes** (7 horas) – Organizado por CUIMPB y Centre Ernest Lluch. Online, el 16 y 17 de marzo de 2021.

- **Social Media for Researchers** (8 horas) – Organizado por la Escuela de Doctorado de la Universitat Autònoma de Barcelona. Bellaterra (Barcelona, España), el 24 y 26 de Febrero de 2020.

- **Writing Research Papers (Humanities)** (30 horas) – Organizado por la Escuela de Doctorado y el Servicio de Lenguas de la Universitat Autònoma de Barcelona. Bellaterra (Barcelona, España), del 2 de febrero al 25 de marzo de 2020.

- **How to write your thesis in English** (30 horas)- Organizado por la Escuela de Doctorado y el Servicio de Lenguas de la Universitat Autònoma de Barcelona. Bellaterra (Barcelona, España), del 3 de octubre de 2019 al 5 de noviembre de 2019.

Docencia

- Asignatura "**Mobilitat, Logística i Transport**" del *Grado en Smart Cities* de la Universitat Autònoma de Barcelona.
    - Setiembre a diciembre de 2021 (24 horas de docencia).
    - Setiembre a diciembre de 2020 (24 horas de docencia).
- Asignatura "**Anàlisi Geogràfica del Delicte**" del *Grado en Criminología* de la Universitat Autònoma de Barcelona.
    - Febrero a Junio de 2021 (24 horas de docencia).
    - Febrero a Junio de 2020 (24 horas de docencia).

12.3. Estancias de investigación en el extranjero

- **Healthy Liveable Cities Group, Centre for Urban Research, RMIT University**. Melbourne, Australia. Supervisión: Dra. Lucy Gunn y Profesora Billie Giles-Corti. Fechas: 17/01/2023 – 14/04/2023. Nº días: 88. Financiación: Beca de movilidad para jóvenes investigadores de la Fundació Amics del País.
- **Urban Science Lab, Research Center of Advanced Science and Technology. Department of Urban Engineering. University of Tokyo.** Tokio, Japón. Supervisión: Profesor Yuji Yoshimura y Profesor Hideki Koizumi. Fechas: 14/09/2022 – 09/12/2022. Nº días: 85. Financiación: Beca de movilidad FPU Estancias Breves del Ministerio de Universidades.
- **Chaire Entrepreneuriat, Territoire et Innovation, IAE Paris, Paris 1 Panthéon-Sorbonne.** París, Francia. Supervisión: 08/09/2021 – 07/12/2021. Nº días: 90 días. Financiación: Beca de movilidad FPU Estancias Breves del Ministerio de Universidades.

12.4. Otras publicaciones

- **Gómez-Varo, I.** & Miralles-Guasch, C. (forthcoming). Assessing Mobility of Care: An overview of the approaches and current challenges for mobility research. I*n S. McLafferty, V. Preston, & M. Maciejewska (Eds.), Handbook of Gender and Mobilities.* Edward Elgar.
- Murillo-Munar, J., **Gómez-Varo, I.**, & Marquet, O. (2023). Caregivers on the move: Gender and socioeconomic status in the care mobility in Bogotá. *Transportation Research Interdisciplinary Perspectives*, 21, 100884. https://doi.org/10.1016/j.trip.2023.100884
- Marquet, O., Tello-Barsocchini, J., Couto-Trigo, D., **Gómez-Varo, I.**, & Maciejewska, M. (2023). Comparison of static and dynamic exposures to air pollution, noise, and greenness among seniors living in compact-city environments. I*nternational Journal of Health Geographics*, 22(1), 3. https://doi.org/10.1186/s12942-023-00325-8
- Vich, G., **Gómez-Varo, I.**, & Marquet, O. (2023). Chapter 3—Measuring the 15-Minute City in Barcelona. A geospatial three-method comparison. En *Z. Allam, D. Chabaud, C. Gall, F. Pratlong, & C. Moreno (Ed.), Resilient and Sustainable Cities* (p. 39-60). Elsevier. https://doi.org/10.1016/B978-0-323-91718-6.00004-9
- Roig-Costa, O., **Gómez-Varo, I.**, Cubells, J., & Marquet, O. (2021). La movilidad post pandemia: Perfiles y usos de la micromovilidad en Barcelona. *Revista Transporte y Territorio*, 25, Article 25. https://doi.org/10.34096/rtt.i25.10958

13.1. Carta de los coautores

GEMOTT
Grup d'Estudis de Mobilitat Transport i Territori

Estimats membres de la Comissió Acadèmica del Programa (CAP),

Ens adrecem a vosaltres avui per certificar formalment la nostra participació com a co-autors en els materials presentats dins la tesi per compendi de publicacions titulada *La vitalidad urbana en la metrópolis de Barcelona. Una reinterpretación contemporánea del legado de Jane Jacobs* i realitzada per la doctoranda Irene Gómez Varo.

Per la present constatem que cap dels materials, resultats o conclusions presentats en aquesta tesi no s'han utilitzat en cap altre treball acadèmic o tesi fins a la data. Ens adherim a les polítiques acadèmiques de l'escola de doctorat de la Universitat Autònoma de Barcelona i comprenem la importància de mantenir la integritat i l'autenticitat del treball de recerca.

A més a més, ens comprometem a no utilitzar cap dels materials o resultats presentats en aquesta tesi en qualsevol futur treball acadèmic o tesi sense la corresponent citació i reconeixement.

Moltes gràcies.

XAVIER DELCLÒS ALIÓ - DNI 48009057F
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Xavier Delclòs Alió

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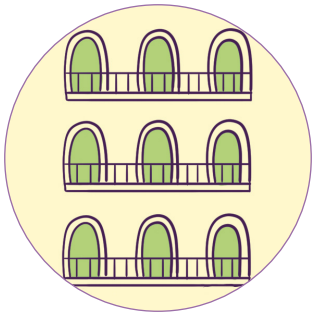

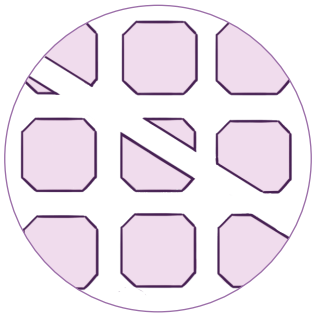

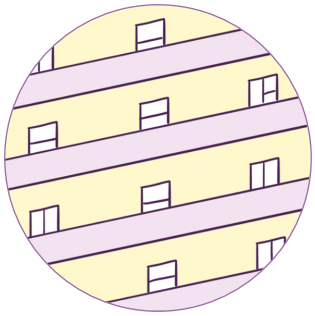

Ilustración: Aitana Giráldez.