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REHABILITATING A MASS HOUSING NEIGHBORHOOD IN BARCELONA, A SUCCESSFUL TRANSFORMATION?¹

REHABILITANDO UN BARRIO DE VIVIENDA MASIVA EN BARCELONA,
¿UNA TRANSFORMACIÓN EXITOSA?

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Los barrios de vivienda masiva desarrollados en la segunda mitad del siglo XX constituyen una parte importante del parque de viviendas sociales y asequibles del sur de Europa, pero sufren problemas sociales y degradación física. Centrado en un estudio de caso de transformación arquetípica de una urbanización en Barcelona (Canyelles), este artículo pretende identificar las condiciones necesarias para reducir las desigualdades sociales en este tipo de barrios, además de la implementación de programas de rehabilitación urbana. La metodología mixta aplicada consistió en una combinación de entrevistas semiestructuradas con los principales actores involucrados, un grupo focal con la junta de vecinos y un análisis estadístico multivariante de indicadores sociales a escala fina intraurbana. A partir de estos métodos, analizamos los proyectos de transformación urbana, así como sus consecuencias sociales, que se pueden observar en la evolución de la composición social del barrio. Por lo tanto, observamos una mejora significativa en la calidad de vida de los vecinos como resultado de programas, tanto de rehabilitación de viviendas como de renovación de espacios públicos. Finalmente, estos cambios están contribuyendo a aumentar la integración social, así como también a iniciar un proceso de gentrificación.

Palabras clave: vivienda masiva, rehabilitación, espacios públicos, integración social, gentrificación.

Mass housing neighborhoods emerged in the second half of the twentieth century as an important part of the affordable social housing stock in Southern Europe, but now these are suffering from social problems and physical degradation. This article, which focuses on a case study of an archetypical transformation of a housing estate in Barcelona (Canyelles), aims at identifying the conditions needed to reduce social inequalities in this type of neighborhood and implement urban rehabilitation programs. The mixed methodology applied consisted of a combination of semi-structured interviews with the main actors involved, a focus group with the neighborhood council, and a multivariate statistical analysis of intra-urban fine-scale social indicators. Based on these methods, the urban transformation projects and their social consequences, which can be observed in the evolution of the social composition of the neighborhood, are analyzed. A significant improvement in the quality of life of the neighbors is seen as a result of the housing rehabilitation and renovation of public spaces programs. Ultimately, these changes are contributing to increasing social integration, as well as initiating a gentrification process.

Keywords: mass housing, rehabilitation, public spaces, social integration, gentrification.

I. INTRODUCTION

The shortage of social housing in southern Europe has meant that the regeneration of mass housing neighborhoods of the late Francoism (1960s-70s) has become especially relevant in housing policies on representing an important part of the housing stock available today (Arbaci, 2019; Pareja-Eastaway & Sánchez-Martínez, 2017). Part of the research on this issue focuses on the importance of strategies that combine urban renewal projects and social intervention programs to solve inequality and social exclusion problems in these neighborhoods (Hall et al., 2005; Hess et al., 2018; Rowlands et al., 2009). However, it is also possible to identify specific cases where effective transformations can be achieved by using physical interventions to achieve the sought-after social goals (Belmessous et al., 2005). The underlying issue is the need to identify whether effective social and urban changes are now possible thanks to physical interventions, whether the initial social conditions allow these interventions to be effective, and/or whether there is a social dynamic independent of the rehabilitation or renovation projects carried out.

This article seeks to point out some lessons about the relationship between a rehabilitation process in a physically degraded neighborhood and the long-term social dynamics. In this way, the main objective is to identify the conditions of a mass housing neighborhood needed so that physical rehabilitation strategies can contribute to a transformation of its social composition and in this way, solve the associated inequality problems. One way to reduce inequality could be the result of generalized upward social mobility (Arbaci, 2019) by improving living conditions and education. Another possible way would be displacing and replacing social exclusion families with others that have greater economic and cultural capital (Fernández Arrigoitia, 2018).

In this sense, this article is part of studies on the processes of physical transformation of mass housing neighborhoods and their possible social consequences in the context of southern European cities. Specifically, a case study is made in Barcelona, in the Canyelles neighborhood, whose choice is because it is a project that is considered successful *a priori* from the perspective of physical intervention, thanks to the combination of the comprehensive rehabilitation and reorganization of public spaces. In addition, this transformation seems to be accompanied by an improvement in its overall perception by its residents and the rest of the citizenry. Within the working-class district of Nou Barris, the possible recent increased

attractiveness of this mass housing neighborhood is also part of the significant improvement of its accessibility to other parts of the city. Given the initial nature of a peripheral enclave that is slightly above the city center and weakly connected to it, two major metropolitan transformations are combined to change the latter. On one hand, connectivity with the rest of the city is improved with the design of the Ronda de Dalt ring road, built as part of the 1992 Olympic Games infrastructure program. On the other, the Canyelles metro station which opened in 2003, allows direct communication with the urban center of Barcelona.

This article is structured as follows: after this introduction, a theoretical section looks at intervention policies in degraded mass housing neighborhoods. Then, the mixed methods used in the research are presented, before presenting the case study. The results are organized into two main sections. First of all, the rehabilitation projects in the Canyelles neighborhood are explained. Secondly, the social changes in the studied neighborhood are presented regarding the metropolitan dynamics observed in recent decades. The article ends with a discussion section and conclusions on the relationship between social transformations and urban rehabilitation.

II. THEORETICAL FRAMEWORK

The crisis of affordable and/or social housing has become a key issue in government strategies on different scales that aspire to approach the goal of ensuring the right to the city and adequate housing for all citizens (Lefebvre, 1972; Rolnik, 2019; Wetzstein, 2017). The physical decline and social problems of mass housing neighborhoods in the second half of the 20th century justify the need for different wide-reaching restructuring or regeneration strategies (Rowlands et al., 2009; Van Kempen et al., 2005; Watt & Smets, 2017). However, there is no single recipe to overcome the formal and social problems observed in this type of housing complex. In addition, the structural differences in terms of home ownership typical of the territorial contexts influence the type of strategies followed. In general, two main types of approaches can be distinguished when implementing these policies depending on whether social programs are included. On one hand, a "classic" vision, based on physical intervention either in the absence of public intervention or based on an intervention piloted by the State. This type of approach ranges from rehabilitation projects of certain houses to physical renovation projects of mass housing neighborhoods that include the total or partial destruction of buildings where there is extreme physical or social degradation (Hess et al., 2018).

On the other hand, the regeneration or comprehensive urban rehabilitation approaches, depending on the degree of physical intervention in the neighborhoods in question, are characterized by a combination of a program of social inclusion measures and the promotion of economic activities. This group is part of the social mix strategy, which specifically seeks to attract new middle and upper-class residents to these working-class neighborhoods and their marginalization and social exclusion issues, usually involving relocations (Lelévrier, 2013). In the Spanish context, the comprehensive rehabilitation programs carried out in this type of neighborhood are also part of this second approach (Hernández Aja et al., 2015). In this sense, the Integrated Rehabilitation Areas (ARI, in Spanish) and especially the URBAN programs, since the 2000s, are initiatives that use building rehabilitation and public space redevelopment, along with a program of socio-economic revitalization actions (Hernández Aja & García Madruga, 2014; De Gregorio Hurtado, 2017). This approach to the transformation of degraded neighborhoods, which includes aspects related to urban form and social programs, is directly linked to integrated urban regeneration. This trend contributes to changing previous transformation strategies for these mass housing neighborhoods, focused on the formal intervention in the built space and reduced to highly spatially localized actions or accessibility strategies. Despite this, even some of the paradigmatic cases of integrated approaches, such as the one in the Barrio de la Mina (Barcelona Metropolitan area), show that there are few items budgeted for social inclusion programs (Jornet et al., 2009).

Regeneration or comprehensive rehabilitation strategies, and in particular those that seek social mixing, can generate an undesirable effect such as the displacement of long-term residents with the arrival of new middle- and upper-class inhabitants, typical of gentrification processes (Fernández Arrigoitia, 2018). This type of social change in these neighborhoods is being promoted by housing financialization (Aalbers, 2019; García-Lamarca, 2020; Rolnik, 2019), as well as the marketization and privatization of the social housing stock (Bernt et al., 2017; Gurran & Bramley, 2017; Lelévrier, 2021). At the same time, some research has focused on the impact and evaluation of regeneration strategies on the dynamics of segregation and social exclusion in these large housing complexes in different territorial contexts (Arbaci, 2019).

In Europe, there is a growing ethnic and social segregation, especially in social housing neighborhoods (Tammaru et al., 2016). In any case, the macro-regional and state differences in Europe are essential to understand the differences in social trends observed with regeneration processes (Hess et al., 2018). Arbaci indicates how the housing stock structure, dominated to a large extent by

resident owners, as well as the residential distribution between native and foreign groups, are essential factors that explain *low levels of ethnic spatial concentration vis-à-vis high levels of social marginalization* observed in southern European cities in recent decades (Arbaci, 2019, p. 303). Focusing on the context of Spanish metropolises, increasing segregation, social vulnerability, and ethnic diversity in mass housing neighborhoods are explained, as the result of former residents being replaced with the arrival of foreign migrants (Sorando et al., 2021; Uceda et al., 2018).

III. CASE STUDY

A mass housing neighborhood in Barcelona: Canyelles

The shortage of social housing in southern European countries such as Italy, Portugal, or Spain, compared to other Western countries, is explained by the weakness of their welfare state in the 20th century and their approaches to housing policies (Arbaci, 2019; Lanero, 2020). The social housing policy in late-Franco Spain sought to eradicate slums and was characterized by a strategy promoting deferred access to property. For this reason, the social mass housing neighborhoods financed by the state, through organizations such as the National Housing Institute (INV, in Spanish), looked to change the initial public ownership of homes to the private ownership of their residents after two decades (Lanero, 2020; Scanlon et al., 2014). Thus, today, these homes are considered mass housing neighborhoods, not social housing, because their ownership structure is mostly private.

In the case of Barcelona, the Barcelona Municipal Housing Board (PMVM, in Spanish), the House Building Union (OSH, in Spain), and the INV promoted building large housing complexes on the periphery of the consolidated urban space, mainly in the 1960s and 1970s (Ferrer i Aixalà, 1996; Tatjer & Larrea, 2010). Many of the mass housing neighborhoods built have been the subject to public-led regeneration programs, especially regional and local ones, among which the Catalan government's neighborhood program stands out (Generalitat de Catalunya, 2006a), and its continuation in the city of Barcelona with the so-called *Pla de Barris* (Ajuntament de Barcelona, n.d.). Among the mass housing neighborhoods built towards the end of the Franco dictatorship, Canyelles was one of those that managed to implement several physical transformation projects within these programs.

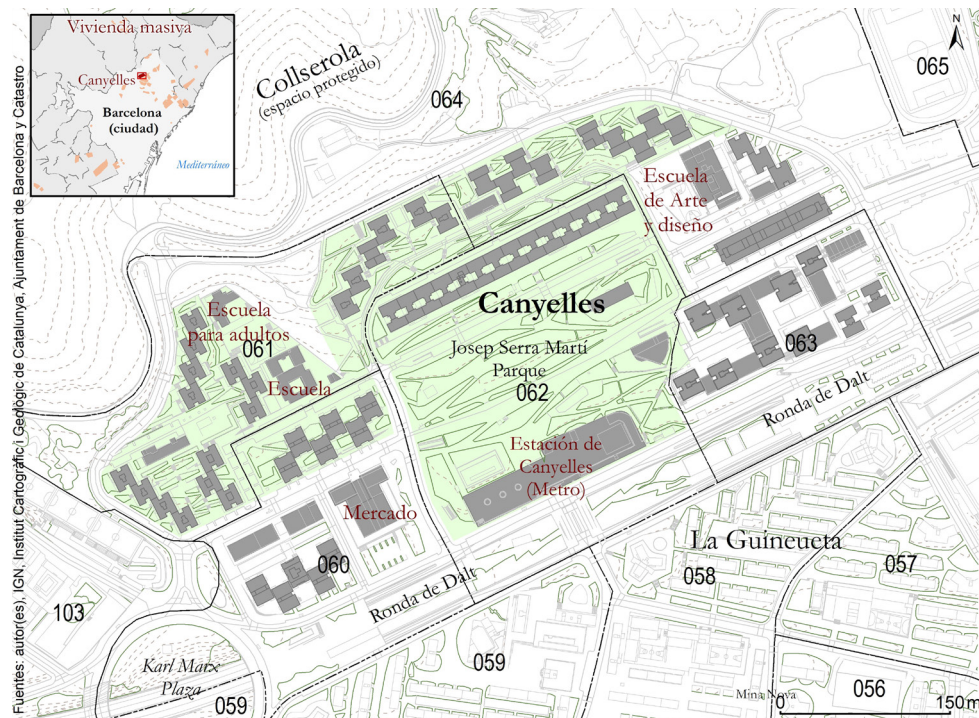


Figure 1. Map of Canyelles in the city of Barcelona. Source: Preparation by the author.

Canyelles is a mass housing neighborhood of just under 3,000 homes and 7,000 residents, located in northeastern Barcelona, next to one of the entrances to the Sierra de Collserola park, in a working-class district with a high concentration of housing estates (Nou Barris) (Figure 1). It is one of the last neighborhoods promoted by the PMVB in the Franco period in this city (built between 1974 and 1978) and one of the first built using industrialized construction techniques (Ferrer i Aixalà, 1996). This neighborhood (like many others of that type), from its inauguration and throughout the 1980s, was characterized by a lack of basic equipment and infrastructure and by suffering serious social marginalization issues. Although, its long tradition of neighborhood associations contributed to obtaining improvements in the neighborhood's living conditions.

IV. METHODOLOGY

This article applies a mixed method that combines quantitative and qualitative techniques, which allows, on one hand, identifying the main characteristics of rehabilitation and redevelopment projects and, on the other, contrasting the social dynamics seen from the

perspective of residents and the main urban agents involved. In this sense, three types of materials were used for this research: i) statistical; ii) documentary; and iii) fieldwork. The latter includes anthropological observations from different visits made in March 2019, on the progress of the latest rehabilitation phases with the accompaniment of some of the urban agents involved and the residents' spatial practices. As for the former, this uses the population and housing statistical data produced by the official statistical agencies at a local, regional, and state level. This addresses the resident population by education level, professional activity, income, and housing according to the tenure system, focusing on the latest available official databases. With these data, a multiscale statistical analysis was made (from the census for the center of the metropolitan area) which combines several social indicators (Table 1). Synthetic indices such as the segregation index (SI) were used to measure and compare the evolution of metropolitan residential segregation processes (Musterd et al., 2017). In this case, these variables were used to explain the situation of the current spatial pattern and the recent evolution of social inequality in this neighborhood of Barcelona compared to the central part of the metropolitan area. The period between 2001 and 2021 was used as a timeframe for the diachronic

Variable	Finest scale available	Period or date	Source
Resident population (total)	Census sections	2001-present	INE (Census and Electoral Register)
Population by nationality (Spanish and foreign)	Census sections	2001, 2011, 2021	INE (Census and Electoral Register)
Population by age group	Census sections	2001(*), 2011, 2015-2017, 2021	INE (Census and Electoral Register), Idescat, and Statistics of Barcelona
Level of studies (4 levels)	Census or neighborhood sections	2001(*), 2011, 2013-2020, 2021(*)	INE (Census and Electoral Register)
Unemployment rate	Census or neighborhood sections	2001, 2011, 2015-2020	INE (Census and Electoral Register)
Income after tax (by type of tax)	Census or neighborhood sections	2015-2018	INE, Idescat, and Barcelona Statistics

Table 1. Main socioeconomic variables used in multiscale statistical analysis. Source: Prepared by the author based on data from the official statistical institutes. (*) Incomplete data series at a detailed scale.

analysis, and the latest data available for the analysis of the current profile. As a reference to the social situation of the neighborhood's first few decades, the indications in the project documentation and the discourse of the residents were considered.

With regard to the qualitative methods, on one hand, the legislative documents on housing and documentation of the rehabilitation programs and projects built in Canyelles were accessed. Then, an analysis of the discourse of the different agents involved was prepared based on a series of eleven semi-structured interviews with architects, urban designers, and urban planners related to building rehabilitation and the reorganization of public spaces in Barcelona's housing estates (6) and specifically of Canyelles (5). On the other hand, a focus group was organized with different long-term residents who are actively involved in the neighborhood association. An open transcription and coding were made from the recordings, to make a qualitative analysis of the discourse (Dittmer, 2010). The interviews and the focus group followed a common question guideline that allowed comparing information on the perception and the discursive position of the different participants (Longhurst, 2010).

V. RESULTS

Projects for the rehabilitation of housing blocks and redevelopment of public spaces

The physical interventions that stand out within the neighborhood involve the public space and the housing

blocks. On one hand, within the framework of the regional plan to transform this type of mass housing neighborhood (Generalitat de Catalunya, 2006b), a block rehabilitation project has been implemented since 2015 (budget of 40.2 million euros) led by the Catalonia Housing Agency, which establishes co-financing between the municipality Housing Consortium (25%), the Generalitat de Catalunya (60%), and the communities of owners of each housing block (15%). This project, in an advanced state of execution, has allowed consolidating parts of the residential blocks and towers that had carbonation and detachment risks, waterproofing their roofs, coating facades to solve insulation issues, and repainting them following a global chromatic plan (Figure 2). The different agents and residents agree when expressing their satisfaction with the quality-of-life improvements obtained, emphasizing the issue of thermal insulation and the finishings of the buildings. The urban agents point out that this latest transformation of the neighborhood is based on infrastructures that increased the neighborhood's connectivity with the rest of the city. This aspect has been included thanks to the partial resurfacing of the Ronda de Dalt ring road in the 2000s, improving local transversal connectivity with neighboring areas and the creation of new public spaces, as indicated by one of the main urban planners:

Connecting the neighborhood's essential interests to incorporate them into these [the ring roads], which are a mixture of infrastructure and public space. That's where the coverage came from, [...] the transversal connectivity of these spaces, but with the condition that [the ring roads]



Figure 2. Rehabilitation of a housing block and elevator as an example of improving accessibility. Source: Preparation by the author (2019/01/12)
Figure 3. Ramps, gardens, and furniture of the first public space transformation phases in the first decades of the 21st century. Source: Preparation by the author (2018/11/01)

would never be covered when there are ramps. (Architect 1, personal communication, 2019/03/18).

On the other hand, the district of Nou Barris, since 2007, has commissioned the development of several transformation phases and redevelopment projects of Canyelles' public space that have consisted, initially, of reorganizing the landscape of spaces and secondary roads in the western half of Canyelles. The ramps with opaque side walls were replaced by open and non-slip ones, and stairs with stainless steel railings and elevators were installed to cross the larger slopes (Figure 2 and Figure 3).

In 2021, the last phase of the public space redevelopment project of the eastern half of the neighborhood began, led by the municipal company BIMSA (Barcelona Municipal Infrastructure). This included creating fully accessible routes between the lower part around the ring road, and the higher part in contact with the mountain range, and also reduced the number of parking spaces and cars circulating. Lighting was increased, and high walls and vegetation were avoided, reducing low visibility areas under what would be called *urbanism* with a *gender* and inclusive perspective (Architect 7, personal communication, 2019/03/13).

The long-term residents of Canyelles consider this series of transformations momentous in improving the neighborhood's image, which had been in place especially since the second half of the nineties: "At first, no one wanted to live [here] or they wanted to leave, now everyone is in love with their neighborhood." In this sense, the central

park of Canyelles is "*a lung (...) and a meeting point*" (Focus Group, personal communication, 2020/12/15), used as an example of a public space success story experienced daily by the inhabitants of the neighborhood and nearby urban sectors. Regarding the housing rehabilitation projects and the reorganization of public spaces, the residents interviewed indicate that many families who gained access to a property in this neighborhood continue to live in it and that there are no forced changes of residence for economic reasons. In addition, they indicate that, for a few years, homes have been created in the old commercial basements of certain blocks, to be sold or rented:

Most of these [commercial] premises are being transformed into housing, into lofts [...] What used to be small businesses, have made a 25-40m² loft [...] They get a return that they didn't get before. Some companies are buying the basements to do this. (Focus Group, personal communication, 2020/12/15).

Recent socio-economic and residential segregation trends of the neighborhood in the metropolitan context

Social dynamics and residential segregation. Canyelles, from the social point of view, started with a composition marked by the predominance of the working class and the existence of social exclusion and conflict issues comparable to other neighborhoods of the same origin. According to the residents interviewed, there was a reduction in marginality in the mid-nineties with

	Median income per individual (euros per year, 2017)	Median household income (euros per year, 2017)	Evolution of median income by individual 2015-2017 (%)	Evolution of the median household income 2015-2017 (%)	Gini Income Index (2017)	Ratio of Decile 8 / Decile 2 for incomes (2017)	Percentage share of wages in income (2017)	Percentage of pension participation in income (2017)	Percentage share of other social assistance in income (2017)
Metropolitan area	18750	51514.6	6.4	5.9	30.4	2.6	-	-	-
Barcelonés (center of the metropolitan region)	15470	40766	4.8	6.1	32.5	2.8	62.5	21.4	4.2
Barcelona (municipality)	19250	44433	3.8	2.5	36.4	3.1	59.0	19.2	2.8
Nou Barris District (Barcelona)	15050	36287	4.9	4.0	32.9	2.9	60.0	23.8	3.2
Canyelles - section 60	18550	44388	3.9	8.5	30.4	2.6	51.5	31.1	5.7
Canyelles - section 61	16450	34650	4.4	-14.9	29.0	2.3	69.0	14.7	2.3
Canyelles - section 62	18550	48115	12.8	5.3	26.5	2.3	67.1	17.2	4.4
Canyelles - section 63	22050	54530	3.3	4.9	28.1	2.6	50.6	35.1	4.4
Canyelles - section 64	15750	39629	4.7	8.9	29.4	2.5	53.0	33.0	5.0

Table 2. Income indicators at different scales for the census sections of Canyelles and the center of the Barcelona metropolitan area. Source: Prepared by the author based on the data of the Spanish National Institute of Statistics (INE).

the residential change of several problematic families. Currently, Canyelles has a recent demographic stagnation, with a strong aging (29.7% of people over 65), and a density of inhabitants per hectare of 627, lower than that of the district as a whole (748 inhabitants/ha). This indicator, together with the formal layout of the buildings (Figure 1), provides a first observation of a neighborhood that has a high rate of free space despite being located in a central municipality of Barcelona.

On the other hand, the education levels and unemployment rates show a fundamental social change

that has taken place in this type of neighborhood, which initially comprised working social classes with little education. When considering people without basic studies, in Canyelles quite high values were seen in 2001, of 18.6%, which decrease to 3.9% in 2020, although still higher than the relative value of the municipality of Barcelona (2%). At the other end of the study level spectrum, if data for people with university education is considered there has been a significant increase in the same period, reaching over 13% in 2020. Even so, this is slightly lower than the city of Barcelona (15.5%). As for unemployment, Canyelles continues to have slightly higher percentages

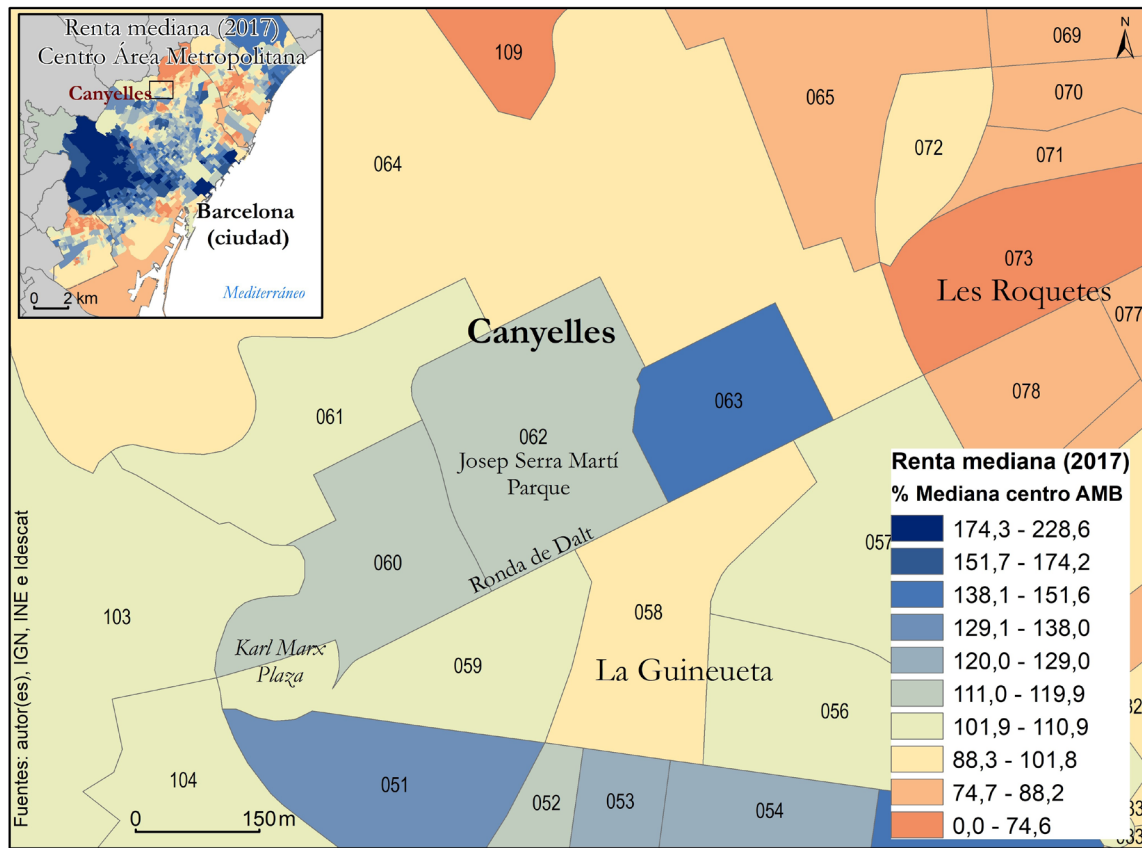


Figure 4. Median income for individuals in 2017 using the census scale of Canyelles compared to the values for the central part of the Barcelona metropolitan area. Source: Preparation by the author.

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than those registered in the district (but lower than other neighborhoods of this type, such as Trinitat Nova) and higher than those of the city, falling from 18.9% in 2001 to 13.5% unemployment in 2020 (in Nou Barris and the municipality of Barcelona, the figures were 11.2% and 8.5%, respectively).

But what stands out in Canyelles' social composition is its especially low level of foreigners, 6.7% in 2020, while in the district as a whole, the percentage is 20.3%. This implies a differentiated social dynamic compared to the rest of the district's old mass housing neighborhoods. The foreign population segregation index, on the census scale in Canyelles, shows an especially low value of segregation in 2021 (9.1) decreasing with respect to 2011 (26.8). These figures are much lower than those obtained on the same scale in the district of Nou Barris (21.8 in 2011 and 36.8 in 2011) and the city of Barcelona (24.2 in 2021 and 34.8 in 2011).

Recent socio-spatial profile. To characterize the

neighborhood's current situation, the analysis of the indicators related to the available rental properties (Table 2 and Figure 4, respectively), indicates values that are globally higher than those of the district average, and are similar to or slightly higher than the median of the center of the metropolitan area (Barcelona). Individual income inequality levels are lower than those observed in the other territorial scales, with a Gini index of less than 30 and a ratio between deciles 8 and 2 of around 2.5 in the census sections of Canyelles. Considering this indicator, the income levels of residents are more equitable than in the district, the city, and the center of the metropolitan region.

Canyelles differs from other traditional working-class neighborhoods at the heart of the Barcelona metropolitan region by having a much lower percentage of young residents, people without studies or illiterate, as well as unemployment rates that are comparable or moderately higher than those of the city as a whole. Thus, the Canyelles census sections are linked to two intermediate

classes or profiles that are characterized by a high level of equity considering median available individual incomes and a markedly aging population. A second class of census sections is related to a high proportion of residents with university studies, median incomes equivalent to those in the center of the metropolitan region, and the presence of residents with a profile of potential gentrifiers.

Through the confirmation of the socio-spatial patterns observed, the long-term residents interviewed indicate a recent trend of a certain substitution of these by their descendants or new tenants, in addition to pointing to a higher rental price than similar housing in other mass housing neighborhoods of the district. *"most of us are owners here (...) when a person dies, usually, the heirs either come to live or rent. [Foreign] immigration, there's practically none (...); "(...) it is rare that rents fall below 800 euros [40% more than in neighboring areas]"* (Focus Group, personal communication, 2020/12/15).

VI. DISCUSSION AND CONCLUSIONS

This article addresses the transformations of a large mass housing neighborhood with physical degradation problems in a southern European metropolis. All the series of physical interventions in the urban fabric, accompanied by the improvement of internal mobility, safety, and accessibility of the neighborhood, have served to achieve an attractive lifestyle for residents and reduce structural deficiencies. On one hand, public spaces saw improvements in their quality and adaptation to the different groups of citizens. This confirms the idea of García et al. (2020) that the amplitude and formal arrangement of free spaces for public use is an essential factor for the habitability of this type of large mass housing neighborhood. On the other hand, comprehensive rehabilitation projects of residential buildings solve the serious problems of landslide risks and isolation. These changes and their metropolitan centrality, thanks to an increase in accessibility, reinforce its good image and tendency towards a high degree of social inclusion and social equity. This makes Canyelles a strongly attractive neighborhood, although residential offer is scarce. The transformation of commercial basements into new homes for rent (or sale) is an indication of its growing residential attractiveness and, more generally, of the incipient use of emerging opportunities to capture potential rental differentials in housing, through the platform economy (Wachsmuth & Weisler, 2018).

A process of relative upward social mobility has been seen considering a working-class social composition

comparable to that of other mass housing neighborhoods. However, it differs from the dynamics observed in other neighborhoods of the same Nou Barris district, which comprise mainly working class, with social unemployment problems, a high percentage of low-qualified residents, and a high proportion of young people and foreign nationals with social inclusion difficulties (Blanco & León, 2017). In Canyelles, a reduced supply of available housing and the revaluation of the residential stock explains why foreign migrants with low educational and income levels have not settled. In addition, it has been shown that there are no observable segregation processes of foreign residents in the Canyelles neighborhood, which is another indication of social cohesion. These divergences compared to other mass housing neighborhoods in Barcelona confirm the trend explained by Arbaci (2019), regarding the reduction of the ethnic segregation level in central neighborhoods of the metropolises of southern Europe, where there is a "displacement" of this type of segregation towards more peripheral neighborhoods of the metropolitan ring.

The formal transformation takes place in a neighborhood that had overcome its social marginality issues, so urban rehabilitation is successful because of its ability to improve their living environment. At the same time, favoring light dynamics improves social indicators compared to other similar neighborhoods. The two fundamental social changes identified are, first of all, the relative upward social mobility of long-term residents and their descendants, which can be explained by analyzing the increase in median incomes in the census, and the discourse of the residents. This type of mutation in Canyelles consists of intergenerational social mobility, as explained by different authors in the metropolis of southern Europe since the 1990s (Arbaci, 2019, Leal, 2004). Secondly, there is the arrival of new residents from a higher social class, which is directly related to the revaluation of housing due to the rehabilitation projects. The existence of an incipient form of gentrification in large mass housing neighborhoods can be considered without a drastic change in the property structure. Gentrification of these former urban housing sectors, such as Canyelles, is of a slightly different type to that indicated by Fernández Arrigoitia (2018) since it takes place in a real estate setting currently controlled by small resident owners. However, this also constitutes a risk of displacement and loss of community identity.

In conclusion, future research could focus on the specific analysis of the recent social substitution of the first generations of residents from this type of mass housing neighborhood. This will allow identifying changes in housing ownership to characterize the trajectory of the ongoing gentrification process and the assessment of the social impact of rehabilitation projects.

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