

Selective bacterial colonization processes on polyethylene waste samples in an abandoned landfill site

Original

Selective bacterial colonization processes on polyethylene waste samples in an abandoned landfill site / Puglisi, E.; Romaniello, F.; Galletti, S.; Boccaleri, E.; Frache, A.; Cocconcelli, P. S.. - In: SCIENTIFIC REPORTS. - ISSN 2045-2322. - STAMPA. - 9:1(2019), p. 14138. [10.1038/s41598-019-50740-w]

Availability:

This version is available at: 11583/2787611 since: 2020-01-31T09:16:06Z

Publisher:

Nature Publishing Group

Published

DOI:10.1038/s41598-019-50740-w

Terms of use:

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

(Article begins on next page)

SETTING UP A UNIVERSITY CITY. GEOGRAPHIES OF EXCLUSION IN NORTH TURIN

SAMANTHA CENERE* , ERICA MANGIONE**, MARCO SANTANGELO** & LORIS SERVILLO**

* *Department of Economics, Social Studies, Applied Mathematics and Statistics, University of Turin, Turin, Italy. Email: samantha.cenere@unito.it (Corresponding author)*

** *Interuniversity Department of Regional and Urban Studies and Planning, Polytechnic of Turin, Turin, Italy.*

Received: September 2022; accepted February 2023

ABSTRACT

Universities have progressively seen a change in their role as actors in the transformation of cities, with the growth of student populations and related studentification processes that are seen both as drivers of development and causes of negative externalities. What risks being overshadowed, however, is the complex array of interests and agencies that are involved. The aim of the article is, thus, to explore the production of geographies of exclusion that cannot be simply linked to the negative impacts directly exerted by the increased pressure of students' concentrations on specific neighbourhoods. They can also be related to the specific form that urban development strategies driven by higher education institutions takes in post-industrial cities. The case of Turin, Italy, shows that a dominant narrative on the role of universities has triggered various stakeholders' strategic orientation and that, therefore, variegated transformations can be interpreted as the effects of capital investments that materialise in university-related 'fixes'.

Key words: studentification; mixed-method; Turin; university; exclusion; PBSA

INTRODUCTION

In a context of broad massification of university education, combined with the growth in the importance of universities within the logic of global competition between cities as knowledge nodes (Olds 2007; Foote 2017; Moos *et al.* 2019), Higher Education (HE) institutions have progressively seen a change in their role as actors/anchors in the economic, physical, cultural and social transformation of cities (Goddard *et al.* 2014). In literature, the relationship has been investigated both in terms of the positive role of universities for their weight on regional and urban economies (Goddard & Chatterton 1999), and in terms of negative externalities generated by the frictions between uses and users in space at the local

level. Universities' role in urban changes has gone hand in hand with the growth of student populations, whose presence and practices can have important 'material and symbolic effects on the urban landscape' (Collins 2010, p. 940). Under the label 'studentification' (Smith 2005), scholars have highlighted the impact exerted by increasing students' concentration on cities all over the globe, eventually leading to conflicts (Sage *et al.* 2012, for a broader perspective but also insights in specific contexts as in Prada 2019, Gu & Smith 2020, Miessner 2021, Franz & Gruber 2022).

However, looking only at students' agency as a driver of transformations and negative externalities risks underestimating the complex array of interests and agencies that lay behind the production of geographies of (more or less

latent) exclusion and conflicts. Heterogeneous urban dynamics can be located within broader conflict-ridden trends in urban transformation, in which the simplified causal relation between students and exclusion appears misleading. A growing body of literature has moved beyond the first understandings of studentification, investigating how the increased reliance of urban development strategies on HE has supported a new form of capitalist urbanisation (Heslop *et al.* 2022). The forms of socio-spatial exclusion usually associated with increased students' concentrations are traced back to the actions of public institutions, investors and entrepreneurs, who variously try to take advantage of the growing relevance of universities for urban economies.

The case of Turin, located in the North-West of Italy, shows that a dominant narrative on the role of HE institutions has triggered various stakeholders' strategic orientation. During the last 20 years, this former industrial town has tried to leverage on local universities as a crucial asset for the local economic system in a knowledge economy framework. On their part, local universities have shown their relevance both in terms of their capacity to attract new, mobile, young populations and as assets for a broader process of urban socio-economic restructuring (Zasina *et al.* 2021).

The aim of the article is to explore the production of geographies of exclusion that cannot be simply linked to the negative impacts directly exerted by the increased pressure of students' concentrations on specific neighbourhoods. They should also be related to the specific form that urban development strategies driven by HE takes in post-industrial cities. We advocate an alternative understanding of the production of socio-spatial exclusion, framing the process of studentification within broader dynamics of capitalist urbanisation and knowledge 'assetisation' (Ward & Swyngedouw 2018) in a post-industrial city. The article provides evidence on how multiple actions of both institutional actors and players in student-related economic sectors are framed by a broader narrative that identifies HE as a key growth strategy for the city. Therefore, many variegated transformations can be interpreted as the effects of capital investments that materialise in university-related 'fixes'

(Harvey 2001; Jessop 2016), whether they take the form of student housing premises, changes in the commercial and leisure landscapes or profound impacts on the housing market.

To this purpose, the next section frames the theoretical debate to which the paper provides its contribution, followed by the case study and the methodology adopted to conduct the empirical research. The investigated area is Aurora, a neighbourhood in North Turin that has been recently undergoing relevant urban changes mostly, but not completely, related to the transformation of Turin into a university city. The fourth section explores three sites of urban change in the neighbourhood, characterised by the emergence of different forms of socio-spatial exclusion related not simply to the increased concentration of students but also to different 'expression(s) of capitalism in urban space' (Revington 2021, p. 4). The last part synthesises the first insights and highlights possible directions for further research.

STUDENT GEOGRAPHIES AND URBAN DYNAMICS

Academic literature has borrowed the expression 'town-and-gown' to identify the negative externalities produced by HE institutions in cities. Since the beginning of the 2000s, the introduction of the concept of 'studentification' (Smith 2005) has drawn attention to the role played by students as specific inhabitants of the city, stressing how increasing student concentrations in urban areas may engender conflictual and exclusionary dynamics between students and local populations. The first works on studentification explored the UK context and shed light on the economic, physical, cultural and social changes in neighbourhoods. These studies paid particular attention to two types of transformation. On the one hand, they look at the impact of students' residential patterns on local housing markets (Hubbard 2008; Smith 2008), highlighting the production of multiple geographies of segregation (Fincher & Shaw 2009; Munro *et al.* 2009; Sage *et al.* 2012). On the other, studentification as a conflictual dynamic between students and residents¹ over the use of urban space has been also understood as the creation

of consumption geographies and playscapes explicitly catering to students and young population (Chatterton 1999; Chatterton & Hollands 2002; Malet Calvo *et al.* 2017). Exclusionary dynamics associated with processes of studentification are described in terms of multiple negative effects that the rise of student populations brings to residents, both directly (i.e. noise, dirt, disturbance) and indirectly (i.e. displacement, change in local housing market, place transformation).

However, this approach to studentification risks overestimating the role of students while focussing on the immediate effects that growing students' concentrations bring to a neighbourhood. It tends to overlook other agencies, public and private actors, as well as the broader policy and planning context that favours the studentification of a neighbourhood. Specific local and supralocal factors pave the way to the production of socio-spatial exclusion generally associated with studentification, factors that cannot be limited to the effects of students' agency on residents.

Recently, research on the role of HE in urban development, inspired by a political economy approach, has widened the scope of the factors that produce forms of socio-spatial exclusions related to the role of universities in the development of cities and neighbourhoods. Rather than focussing on the typical social and cultural transformations associated with increased students' concentrations, this perspective shifts the attention towards the complex array of drivers that lead to the production of space for university students, thus including multiple actors—not only students—in the production of socio-spatial exclusion. This approach allows to broaden the scope of the investigation, accounting for the heterogeneous tensions that may arise between strategies of urban development revolving on HE and local needs. Indeed, 'the process of studentification links with new ways in which capital is circulating through the urban environment, seeking new markets or lifestyles for commodification' (Gregory & Rogerson 2019, p. 178).

The relationship between HE institutions, the massification of post-secondary studies and processes of capitalist urbanisation manifests in multiple ways. A prolific strand of research has drawn attention to the rapid diffusion of

PBSAs as an example of how vertical expansion (through high-rise buildings) has become a new spatial fix (Nethercote 2019) and to the role of real-estate investors in transforming local housing markets. The negative impacts of PBSAs are associated with the dynamics of housing financialisation, highlighting how 'studentification does not simply arise from growing post-secondary enrolment in a re-structuring knowledge economy city [but] emerges from intentional efforts by firms to create products for investors' (Revington & August 2020, p. 870). The realisation of PBSAs in Waterloo (Canada), for instance, shows how processes of studentification serve the interests and dynamics of urban capital accumulation, laying at the core of a form of spatial segregation constituted by the construction of generational housing submarkets (Revington 2021). In a different context, PBSAs are expected to become the most probable market solution for the lack of student housing attending Chinese universities, promoting exclusionary dynamics (Gu & Smith 2020).

The exclusionary effects associated with the dynamics in the student rental market are often the result of the profit-oriented agency of actors other than students. The emergence of a buy-to-let market in the student accommodation sector (Gibb & Nygaard 2005) and the spreading of private landlordism catering to students (Hochstenbach *et al.* 2021; Miessner 2021) generate affordability issues, wealth inequality, urban segregation and uneven spatial trends. On the one hand, financialisation and commodification of the student housing market leave often aside those students that cannot afford a PBSA or privately rented accommodation (Sotomayor *et al.* 2022). On the other hand, the increased demand of student housing drives speculative transformations at both the neighbourhood and the city level, distorting the local housing market. Looking at the construction of university town in China, Li *et al.* (2014) identify dynamics of land-centred speculative urbanism associated with state-driven initiatives aiming to produce space for students. Here, 'local residents such as displaced villagers are largely marginalised, whilst the profit and livelihood of landless farmers are not fully guaranteed' (Li *et al.* 2014, p. 431).

Investments in PBSA are potentially seen as drivers of exclusionary processes, also in relation to their capacity to attract mainly international and high-income students (Fincher & Costello 2005; Fincher & Shaw 2009; Collins 2010).

The relationship between studentification and capitalist urbanisation is a useful lens to explore the introduction of leisure venues and retail spaces catering to students too. Students both produce and consume specific urban playscapes that are part of the nightlife economy, in areas that are characterised by 'new forms of segmented nightlife activity based around more "exclusive" and "up-market" identities among young adults' (Chatterton & Hollands 2002, p. 96). Drawing a parallel between research on retail gentrification and non-residential studentification processes, Zasina (2021) suggests looking at 'retail studentification' in the frame of urban leisure economy changes, in which the purchasing power and consumption patterns of students are part of the potential boosters of urban economies.

These processes assume a specific form in 'provincial' or 'secondary' cities. While global cities present peculiar dynamics also in the case of university-driven growth, having often stronger property markets, cities that are not in the first tier find in HE institutions and the provision of student services effective means to deal with many unsolved urban issues (Smith & Holt 2007). Post-industrial, secondary cities look at university-driven urban development strategies to overcome multiple crises affecting their social and economic fabrics. In cities struggling to govern their development trajectories, the identification of HE institutions and the knowledge economy as key elements for economic and urban development drives planning decisions in urban contexts that are deeply affected by austerity politics (Heslop *et al.* 2022). Recent investigations have shown how the PBSA business too presents specific features in secondary cities, where the financialisation of student housing provides new opportunities for capital investment in otherwise stagnant housing markets (Revington & August 2020).

Drawing on this literature, the present contribution links socio-spatial exclusion in a

studentifying neighbourhood with different aspects of capitalist urbanisation, avoiding both a too narrow focus on rising student concentrations and the 'students vs. residents' trap. A broader perspective of social and economic entanglements between increasing HE students and processes of urban change points to the heterogeneous tensions arising between HE-related urban development strategies and local needs. As stressed by Foote (2017, p. 1342), 'there is a need to expand the spatial and temporal understanding of neighbourhood change in the knowledge nodes beyond studentification', looking also to wider urban development dynamics that clash with the needs of other local communities. A secondary city still struggling with the constraints imposed by a post-industrial scenario helps in detecting the changes in narrative and the associated processes.

Through the investigation of processes of urban transformation in an area that has become increasingly characterised by a patchworked presence of university students, we aim at including the multiple geographies of exclusion produced as the result of both urban capitalist dynamics, sparked by local coalitions of interests as well as global investments and the rising of students' enrolment connected to the global imperatives of the knowledge economy (Heslop *et al.* 2022). Notably, the article will show how the construction of a PBSA, the proposed conversion of a former hospital into a student residence and the nightlife economy revolving around a commodified student lifestyle exemplify how the combination of policy decisions and capital investments shape the urban space, entailing the production of heterogeneous geographies of exclusion affecting both residents and students.

THE CHANGING DESTINY OF NORTHERN TURIN

Turin, which was mostly known as a typical one-factory town (due to the former automotive manufacturing company FIAT, now Stellantis), has gone through a redefinition of its urban economy since the beginning of the 1980s, leveraging on culture, creativity, 'smartness' and the service sector (Rossi 2015;

Vanolo 2015; Gonzàles *et al.* 2018; Ponzini & Santangelo 2018). Besides the 2006 Winter Olympics enthusiasm, Turin has not yet found a way to overcome its economic decline, which has become dramatic after the 2008 financial crisis. The economic downturn is reflected in the decrease in Turin's population: more than 40,000 residents were lost in the 1998–2018 timespan, with 858,205 inhabitants in 2020 (<https://www.istat.it/en/>).

The attempt to identify a new path to re-launch Turin's post-industrial economy has seen both the University of Turin and the Polytechnic of Turin acquiring progressively a major role in local urban growth strategies². In the span of two decades, the two universities have shifted from being important assets of the city to crucial partners in implementing urban strategic plans and programmes of urban regeneration (Zasina *et al.* 2021). While at first the relevance of universities within urban growth strategies was mainly attributed to their role as knowledge factories, during the last 10 years the focus has shifted on their capacity to become an element of Turin's urban branding strategy and to attract students and investments from other regions and countries (Cenere & Mangione, 2021). In line with this shift, in 2012 the Municipality launched the *Turin University City* plan (Mangione 2019) with the scope of leveraging on universities' capacity to introduce physical, social and economic changes as partners of urban regeneration initiatives.

A flourishing student housing market and the national and international investors' entrance into the sector accompanied this change of paradigm in the urban strategy, sometimes favoured by specific measures adopted by the local government (Cenere *et al.*, 2020). During the last 10 years, the total number of students enrolled at both major universities reached 115,000, with almost 40,000 people coming to Turin from either other Italian regions or from abroad. Spatial transformations came along, differently impacting parts of the city. Both universities have been active in opening new locations, in some cases with flagship sites to become sort of landmarks for a neighbourhood. Contextually, the increased need to accommodate non-local students has fuelled the

dedicated housing supply, either by deflecting the rental market of those areas close to a university site or boosting the construction of public³ and—increasingly—private student residences. These processes have led to the emerging of specific 'studentscapes' made of students' educational, residential and leisure activities (Zasina *et al.* 2021), through which students co-produce urban space and contribute to the transformation of Turin.

The area located close to one of those flagship sites, the Campus Luigi Einaudi (CLE), has been undergoing a particularly intensive process of university-related transformation. CLE is a 45,000 m² campus opened in 2012 on the Dora River, in the Vanchiglia neighbourhood, to the immediate North of the city centre and South of the Aurora neighbourhood, a formerly working-class neighbourhood that is nowadays a patchwork of variegated areas populated by ageing working-class residents, migrants and a newer middle-creative class (Figure 1).

The whole area surrounding CLE has gradually become characterised by the higher presence of students—around 8,000 of which are enrolled in courses that take place at CLE, with an effect on the housing market, the retailscape and the public transport system (Cenere *et al.*, 2020). A quantitative analysis conducted on a sample of 11,763 non-local students (more than 1/3 of the non-local student population), shows a relevant increase in student population (Cenere & Mangione, 2021). Within this sample, from 2010/11 (before CLE was built) and 2017/18, Vanchiglia increased its student population by 67 per cent, and Aurora increased it by 77 per cent, while showing a decrease in resident population (Figure 2).

In Aurora, changes brought by these shifts in students' and residents' populations have become particularly evident. Notably, the part of the neighbourhood adjacent to the CLE—Borgo Rossini—is now extremely popular among students as both a place to live and a nightlife venue. At the same time, relevant real-estate investments in the student accommodation sector have been either made or planned in the whole neighbourhood. These transformations, however, do not happen in a vacuum. Although at a different pace, the whole of

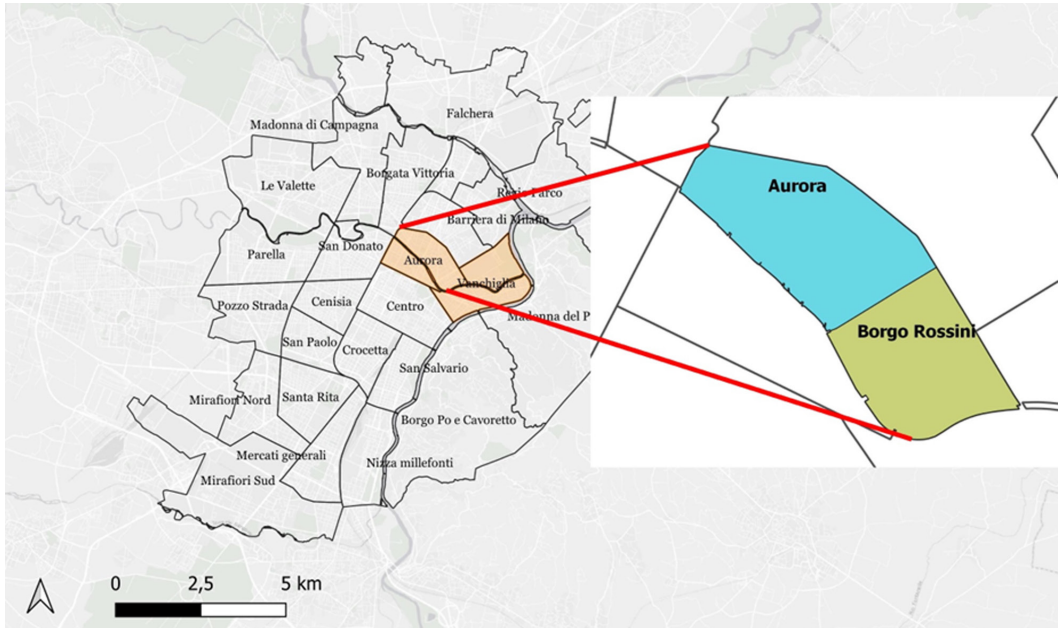


Figure 1. Neighbourhoods Aurora and Vanchiglia, with a focus on the two studied areas (known as Aurora and Borgo Rossini).

Aurora and the Borgo Rossini area specifically show clear but contrasting signs of urban renewal dynamics. Borgo Rossini, once known for its small workshops and other businesses connected to the close historic graveyard, has been rapidly gentrifying since the beginning of 2000s. Now, it is a fashionable area, populated by fancy cafés and eateries, small art galleries and boutiques, a place where well-educated, cosmopolitan, middle-class people in their 30s and 40s crave to live. The area has also experienced an increase in short-term rentals, which represents another sign of incipient upgrading and real-estate transformation (Semi & Tonetta 2021).

However, the western part of the Aurora neighbourhood witnesses quite a different situation. During the last years, both policy-makers and media have depicted Aurora as one of the most problematic areas of Turin. The neighbourhood is characterised by a population living in vulnerable conditions, made in large part by poor migrants, unemployed and elderly (AuroraLab 2017), with enduring public disinvestment and a suffering retail sector⁴.

METHODS

The investigation combines previous analyses of the area (Cenero et al., 2020) with qualitative methods to explore the heterogeneous geographies of exclusion associated with the unfolding of the processes of student-university-related urban changes. We identified three sites, in which a combination of political choices, fine-grain local and international investments and connected urban changes takes the shape of a university-related fix. Here, forms of exclusion emerge as the performative effects of the entanglement between the materialisation of the knowledge economy, universities and forms of capitalist urbanisation, universities and students' increased presence and context-specific features (Figure 3). The first site is the former Maria Adelaide Hospital, on which plans have been made to convert the building into a student residence. The second site is the square known as 'Le Panche' located in Borgo Rossini and neighbouring streets, for their increasing relevance in the geography of students' nightlife. The third site is in the

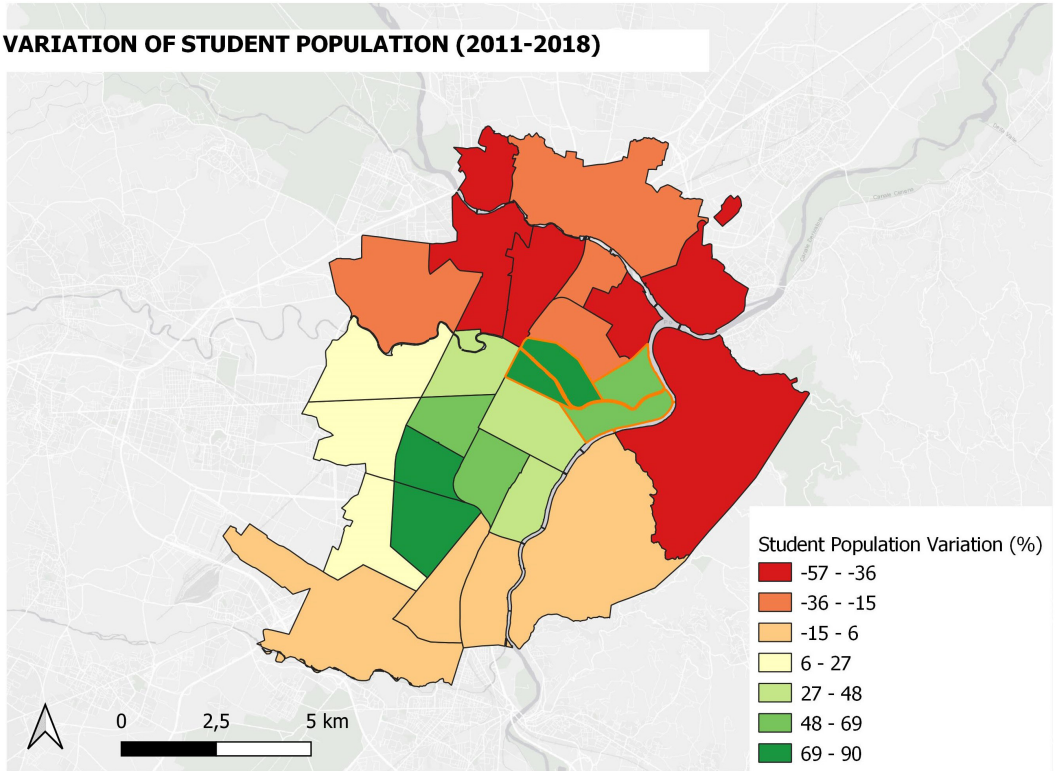


Figure 2. Variation of students' concentration between 2010/11 and 2017/18.

Mosca Bridge area, in which Turin's location of the international PBSA company *The Social Hub* (formerly *The Student Hotel*) is going to open.

We conducted 35 semi-structured interviews to: (1) associations of residents working in the area; (2) associations of residents negatively affected by the analysed transformations; (3) residents in Borgo Rossini; (4) public institutions in the HE field (both local public universities, the Regional agency for the right to study (EDISU) and the local branch of the centre for university sport); (5) local policymakers whose work is either directly or indirectly connected to the *Turin University City* strategy; (6) organisations working on the student rental market, such as the representatives of a union of small landlords and a local platform for student rentals. To shed light on the conflicting interests and visions behind the two student residence projects and the divisive nightlife in Borgo

Rossini, we also conducted observation in three ad-hoc meetings of Turin City Council commissions participated by both council members and representatives of the associations of persons living or working on the affected areas and monitored five social media pages of the associations involved in resisting these transformations from May 2020 to May 2022.

EXCLUSIONARY GEOGRAPHIES, CONFLICTS AND RESISTANCE

The presence of the university has strongly affected the Dora's North riverbank. While various projects of PBSAs construction are already open or on their way, Borgo Rossini, near the CLE, is now extremely popular among students either looking for a place to live or in search for a cool nightlife venue. Notably, the Italian company *Camplus* opened a new location in Borgo Rossini, which may



Figure 3. Studied area with the three sites of interest.

accommodate up to 300 students, while another Italian company, CX, has renovated a former office building to host 92 students in the proximity of the CLE. Other two PBSAs, close to each of the previous, are expected with the renovation of former office buildings.

All these transformations have raised concerns not only among residents but in some cases among students too. Indeed, the progressive dynamics of urban change leading to the construction of a neighbourhood appealing to students involved in the usually uncoordinated agency of heterogeneous actors, whose interests and goals coalesce only in a second moment. At the same time, as will be shown, each transformation entails the reproduction of a different form of capitalist urbanisation, which results in socio-spatial exclusion affecting multiple subjects in different, non-exclusive ways.

In what follows, the production of exclusion is presented as an emergent, contingent socio-spatial effect produced by the entanglement of site-specific transformation linked to university-related changes brought by a knowledge-oriented economy, contextual dimension and affected subjects. Each subsection explores the form of university-related urban change involved, the affected subjects and the conflicts and forms of resistance arising from these processes.

The Maria Adelaide Hospital – The former Maria Adelaide Hospital in the Borgo Rossini area has been for a long period one of two public hospitals serving about 90,000 inhabitants. Both hospitals were shut down by the Region in 2016 in the framework of austerity policies⁵, leaving only two private hospitals, albeit affiliated with the national health system (Interview with a member of the grassroots association *Riapriamo*

il Maria Adelaide, Let's Reopen the Maria Adelaide, RMA). After that moment, the Maria Adelaide has been mainly used as a location for temporary cultural events.

The hospital closure provoked an important backlash. On the one hand, residents complained about the fact that they had to go further to get medical examinations and about the general availability of medical services in the area (Resident, female). The hospital was considered one of the most important points of reference for the residents since they used to go there for x-rays and orthopaedic examinations (Resident, male). But the closure had negative consequences for some local retailers too. For example, the owner of a bakery that has been open for 50 years right in front of the hospital complains about the fact that she lost a great part of her clientele too, made of people going to the hospital and then stopping by to buy some bread (Retailer, female).

During 2020, the Covid-19 pandemic made the reopening of the hospital no longer just an urgent matter but for a moment an actual possibility too. However, the local administration rejected this option. The RMA, created by some of the former staff members of the hospital right after its closure, was relaunched with the support of other citizens during the pandemic. The association worked on an awareness campaign and tried to persuade the regional administration to maintain the sanitary destination of the building. They disseminated information on the various projects that have been proposed by the local administration on the building, both using their social media pages and organising public meetings. When plans to change the destination of the area in the ongoing revision of the City Plan started circulating, the group launched a petition to prevent the destination of the former hospital to be modified into 'service area', reaching a considerable level of support (Members of RMA).

In 2021, the designation of the international university sports competition *Winter Universiade 2025* put a definitive end to the hope of a reopening. The bet was won thanks to the collaboration of the local administration, the two main universities, the EDISU and the University Sports Centre. The sports competition is considered a unique occasion to

brand Turin as an international university destination and to attract students from abroad. A relevant element of the plan for organising the event is represented by the realisation of various residences for the athletes, which are going to be converted into student residences after the competition. The Maria Adelaide is one of the identified locations.

The appointment of the *Universiadi* thus made even more concrete the risk of losing forever the possibility to reopen the hospital and pushed the association to intensify its efforts. The RMA's protest obtained the support of a major union of Medical Doctors and the State medical board, which helped them to draft an alternative plan to open a so-called 'Casa della Salute' (i.e. a local health centre), thus maintaining the sanitary destination of the building. At the time of the article, this effort seems to have succeeded for a small part of the existing building, which may be left for the new health facility. Plans to build a residence are still enduring and the most problematic issue is represented by the project-financing model planned to finance the transformation. The RMA association and local politicians of the opposition lament that the *Universiade* will be used as a further instrument to privatise the student housing sector, on the one hand, without providing an answer to the actual need of public student accommodation facilities and, on the other, contributing to transform the sector into a financial asset.

Le Panche – The 'Esedra di Borgo Rossini', a cosy, small square on the river, nearby the Maria Adelaide, has become one of the youngsters' nightlife epicentres, gaining the nickname 'Le Panche' (i.e. the benches). The nickname has been given by the younger crowd because of the increasing relevance acquired by the homonymous bar on the square. The bar, which opened in 2014 (2 years after the opening of the CLE), is blamed for bringing new practices of consumption that triggered an uncontrolled nightlife economy. But it was only a couple of years ago that the situation became untenable, due to the progressive attractiveness of the bar's low-price policy for drinks, very soon emulated by nearby shops, which changed their opening hours, targeting their offer to young consumers.

Albeit the eateries that have opened in the area during the last 10 years clearly address a clientele made of young, cosmopolitan people, with high cultural capital, the interviewees did not identify these businesses as drivers of exclusion. The arrival of these new businesses is generally considered in line with a retailscape that was already characterised by the presence of activities addressing a clientele in search for high quality, 'authenticity' and good care (Owner of a tearoom, female). However, the nightlife popularity of the square and the adjacent streets full of small night shops became an issue.

The opening of these bars was made possible by a national law that deregulated the business and some local policy interventions, such as the stop imposed on the opening of new bars in other neighbourhoods already saturated and, more recently, the post-Covid ordinance issued by the City that allows retail activities to occupy with terraces the public space near their premises for free. This situation led the area to be labelled in public discourse as one of the neighbourhoods affected by the *movida* problem, that is, to an uncontrolled and disturbing nightlife⁶, associated with the concentration of young people in small outdoor places, alcohol abuse, loud voices and music and general antisocial behaviour (Resident, male).

However, the blaming of this situation is mainly on young people's behaviour. Many interviewed residents and retailers complained about the noise, garbage and occupation of the square and surroundings from the evening until late at night. Changes in the houses (e.g. new windows, air conditioning, etc.) or even transfer to other areas were some of the forced outcomes for the residents. Some of them decided to rent their former flats to students rather than trying to sell them (Resident, male). Others who tried to sell the flat had to face many difficulties: *'We decided with the real-estate agent to schedule the visits to the flat during the morning because from the late afternoon you cannot even get to open the front door'* (Resident living on the square, female).

A vicious circle is exacerbating the negative externalities. Antisocial behaviour (Owner of a bookshop, male), arrival of drug dealers

(Resident living on the square, female), dirt left during the night by young, drunk people and other retailers' clientele pushed away are some of the detected problems.

To resist this process and claim their rights, some residents tried to act through the main grassroots association working in the area, the *Comitato Borgo Rossini* (CBR). To cope with the problems caused by the kind of student lifestyle that is promoted by the new bars, some members of the CBR have first unsuccessfully tried to reach an agreement with the bars' owners. Recently, they engaged in the identification of potential locations where to open youth aggregation centres, as an alternative strategy (President of CBR, male). At the same time, the CBR has tried to directly face the problem by submitting interpellations to the City Council and by grouping with other similar associations in other neighbourhoods.

The Social Hub – The last urban intervention related to the provision of student accommodation and the exclusionary effects so produced is linked to the transformations happening in a formerly public area sold to the international PBSA company *The Social Hub* (TSH), located on one corner of the Mosca Bridge. The bridge connects Aurora to Porta Palazzo, a heterogeneous and vulnerable area closer to the city centre, populated by migrants and low-income groups and hosting the largest food market in the city. In public discourse, the bridge area is usually portrayed as one of the most deprived and dangerous of the city, due to the high presence of drug dealers, homeless, drunk people, drug addicts and a general state of abandonment.

The area where the PBSA is going to open was formerly a factory. In the recent past, the land was publicly owned (Provincia di Torino), with a public school on it. Since the demolition, the area (which was supposed to remain public, according to the City Plan) was left empty, due to the high costs of reclaiming the area from the polluting residues of industrial processes. All the attempts to put it up for auction failed, and the area was temporarily given (1 year) to a local religious organisation, which converted it into

a cricket field for the local Pakistani community. Eventually, in 2020, TSH company bought the area at a much lower price than its land value, due to the pressing need of the city to alienate some of their properties to cover its debt. The company planned to build there a 525-bed accommodation facility, which provides rooms for students, a co-working space, hotel rooms, a gym and other extra services for students and a broader clientele. Each room will cost more than 500 euros per month, which is almost double the average price paid by students for a room on Turin's rental market (Cenere et al., 2022). Moreover, the high costs stand in sharp contrast with the real-estate values of Aurora, the lowest in the city. The strong difference between the PBSA prices and Aurora's average selling price marks a situation of potential residential gentrification driven by a classic rent-gap mechanism (Smith 1979).

Due to the kind of offer and the location chosen for the project, the announced arrival of TSH became soon a very divisive issue. On the one hand, residents who have lived in the area for a long time see it as a good requalification project and eventually even an opportunity for employment (President of a local association of retailers, female). This opinion is shared also by the District's President, who stresses the fact that, according to the current project, TSH will provide the area with a 6,000 m² public garden and that they officially asked TSH to contract neighbourhood residents to work there.

However, some grassroots associations aiding local people in need labelled the project as the 'luxury student residence' and saw another step in the gentrification process of an area in which people need houses, jobs, education and welfare support, instead. Instead, to make room for TSH, the building located on one of the corners of the lot had to be demolished and three local associations were evicted: a dojo gym, whose mission was to leverage on martial arts to prevent youth problems and an instrument for social inclusion; the cultural association *FuoriLuogo*; and the *Comitato di Zona Aurora* (Aurora Zone Committee, CZA). The CZA was particularly affected by the project since their members used to organise after-school activities for children mainly coming

from low-income, migrant families. To resist the project, besides launching an information campaign through its social media accounts, the group organised public meetings in the neighbourhood and submitted formal amendments during the consultation process for the new City plan (Members of CZA, males and females).

DISCUSSION

The empirical research has shown how various forms of socio-spatial exclusion may be associated with the configuration of new student geographies connected either to public interventions or to private actors' agency and interests. Rather than focusing exclusively on the conflicts between residents and students generated by the increasing concentration of the latter and the change they bring to the urban structure, the investigation of the transformations in and around Aurora shows the heterogeneous and contingent ways in which socio-spatial exclusion emerges as unintended effect of these transformations.

Socio-spatial exclusion results as the heterogeneous and contingent outcome of a set of urban transformations, which can be considered as university-related fixes for capitalism urbanisation. Land-rent mechanisms, local business investments, large financial groups' interests and the way needs that are represented—or get overshadowed—take different shapes in the three areas. At the same time, they are all framed by an overarching policy narrative through which a post-industrial city investing in its HE assets advocates a shift for its urban economy. It is such a frame that orients decisions about whose specific interests need to prevail for the broader interest, either explicitly or—most of the time—through implicit non-coordinated decision-making processes.

In the case of *The Social Hub*, the decision to allow for a PBSA to be built on a formerly public, although abandoned, site in one of the most problematic and vulnerable areas of the city configures a case of privatisation that affects both students and residents. Low-income students indirectly experience housing exclusion, both because room prices

are not in line with Turin's housing market and because the city's much-needed student accommodation offer is mostly increased through private rather than public investments. At the same time, the privatisation of the area prevents alternative uses potentially in line with the needs of a highly vulnerable neighbourhood. Finally, the displacement of those associations working on the area affects particularly 'deprived communities' (cf. Sage *et al.* 2012), thus configuring a specific form of student-related geography of exclusion that sees students not as direct cause of the negative impacts produced but as a medium used both symbolically and materially by public and private investors to promote a specific intervention of urban regeneration that does not respond to the needs of the most vulnerable segment of the local population.

The conversion of the former Maria Adelaide Hospital into a student residence financed through a project-financing model is another example of privatisation through which private investments get favoured by local administration within the framework of a competitive urban agenda. In an area that has been already suffering from the rising concentration of students, and where there have been recent investments in the PBSA sector, the risk is to progressively produce a student enclave, potentially displacing former residents (Sage *et al.* 2013). On a more general level, the region's decision to pursue austerity politics in the health sector that provoked the hospital closure and, on the contrary, to promote urban development projects having at the core the provision of a PBSA results in the exclusion of residents' interests and needs from the local political agenda.

The transformation of the main square of Borgo Rossini into a student/young nightlife venue is at odds with the daily life of both residents and retailers of an already gentrified neighbourhood. However, rather than being (only) the students' high concentration and behaviour to cause the place transformation and the exclusion from public space of residents, the entrepreneurial choices made by bar owners and the supportive attitude of the local administration concurred with the production of a night-entertainment-dominated

area, where the needs and daily rhythms of residents and retailers seem to not fit.

These examples of socio-spatial exclusion are neither univocally affecting a homogeneous category of residents nor are directly provoked by the rising student concentrations. The evidence shows how exclusion raises from the new role played by universities within the global knowledge economy and the consequent growth in enrolment numbers, both parts of the processes of capitalist urbanisation of a shrinking post-industrial city.

Unpacking the exclusionary dynamics that unfold in Aurora, in relation to public and private interventions aiming at attracting students, allowed to shed light on how complex is the array of heterogeneous agencies and interests that leads to socio-spatial exclusion. Although the area of 'Le Panche' and the spatial practices of students crowding there at night seem to configure a typical studentification process in which residents are negatively affected by high concentrations of students, the causes behind it are more complex. Processes of socio-spatial exclusion constituted by the disruption of daily life, place transformation and the exclusion from the use of public space have their primary origin in the concurrent agency of some business owners and local authorities, whose interests eventually coalesced in transforming areas of the city in places for commodified leisure. The same is true for the foreseen PBSAs, which see the convergence of private interests to invest in a city where land value is low, a growing real-estate sector and the need for local governments to both find ways to boost the urban economy and to promote regeneration of some areas.

CONCLUSION

The article shows that the production of geographies of exclusion that may go under the label of 'studentification' is not associated only with increasing concentrations of students and their agency. Rather, a broader process of urban change participated by different actors is deemed to cause the mismatch between the university-driven urban development strategies pursued in postindustrial,

secondary cities and the needs of the local population. The negative effects experienced by the broader local community seem to be mainly due to how these strategies and plans are pursued, often out of lack of public resources, without considering the needs of residents, who may feel 'a loss of local control' (Heslop *et al.* 2022, p. 15).

Considering both transformations in the retail sectors and in the housing market of a specific area, the study has shown the multiple ways through which urbanisation processes led in the framework of the knowledge economy and commodification of once public resources may leverage on the needs of the student population, and how it triggers specific urban transformations. At the same time, the rising importance of universities within urban development projects, of post-industrial cities in specific.

In Turin's case, initiatives targeting university students and the realisation of PBSAs represent different albeit integrative forms through which the transformation of the city into a university one becomes a further path for capitalist urbanisation to proceed. Nightlife economy responds to the idea that cities are sites where consumption and leisure can be boosted and highly commodified. At the same time, the introduction of private funds in the conversion of former public areas and buildings shows not only how student housing has become a major urban financial asset but also how the fortunes of formerly disinvested areas are mostly left in the hands of market forces and institutions that do not necessarily can be held accountable for the impact of their initiatives on cities and societies.

ACKNOWLEDGEMENTS

Open Access Funding provided by Università degli Studi di Torino within the CRUI-CARE Agreement.

Endnotes

¹It is important to acknowledge that non-local students live in the city, even if for a relatively limited period and with limited rights as non-permanent

residents. To this extent and for the sake of simplification, in this contribution we will refer to 'residents' when dealing with long-term inhabitants of the city and use the term 'non-local students' for those whose motivation to stay is mainly related to being enrolled to an HEI in general. Finally, students will be considered as one population except when a separation between local and non-local students is needed.

²The University of Turin and the Polytechnic of Turin are the biggest HE institutions in the city but not the only ones. Among others, there are the design institute IAAD and the Fine Arts Academy.

³In Italy, Regional agencies for the right to study provide and regulate access to public student residences, by means of a scholarship system.

⁴Because of the stigmatisation of the whole area, a recent EU Urban Innovative Action has been launched with the aim of addressing the issue of night safety along the Dora River.

⁵In Italy, public health facilities and services are constitutionally the competence of the regional governments.

⁶The term *movida* originated in post-Francoist Spain, during the 1980s, to represent all the joyous expressions of freedom and fun of the youth in the squares, streets and parties of Madrid and other big cities. It has kept this meaning in Italy, standing for mostly uncontrolled or spontaneous forms of nightlife of the younger part of the population.

REFERENCES

- AURORALAB (2017), *Aurora. A sud di Torino nord*. Research Report. Torino: Politecnico di Torino. ISBN 9788885745476.
- CENERE, S. & MANGIONE, E. (2021), Verso la Città Universitaria. L'evoluzione del Ruolo Degli Atenei Nelle Politiche e Nelle Trasformazioni Urbane a Torino. In: F. Dini, F. Martellozzo, P. Romei & F. Randelli, eds., *Oltre la Globalizzazione – Feedback*. Firenze: Memorie Geografiche, nuova serie. ISBN 9788890892684.
- CENERE, S., MANGIONE, E. & SERVILLO, L. (2020), Exploration of Turin: Context and Trends of Social Exclusion, Forms of Coping and Innovative Community Solutions. In: L. Alexander, E. Mocca & Y. Kazepov, eds., *Selection of the 2nd Set*

- of *Case Study Cities*, pp. 107–145. Technical report SMARTDEST.
- CENERE, S., MANGIONE, E. & SERVILLO, L. (2022), Torino da Fuori. In: *Studiare, Abitare e Vivere la Città da Fuorisede*. Torino: Quaderni Future Urban Legacy Lab. Politecnico di Torino. ISBN 9788885745773. <https://iris.polito.it/handle/11583/2973327>.
- CHATTERTON, P. (1999), University Students and City Centres—The Formation of Exclusive Geographies: The Case of Bristol, UK. *Geoforum* 30(2), pp. 117–133.
- CHATTERTON, P. & R. HOLLANDS (2002), Theorising Urban Playscapes: Producing, Regulating and Consuming Youthful Nightlife City Spaces. *Urban studies* 39(1), pp. 95–116.
- COLLINS, F.L. (2010), International Students as Urban Agents: International Education and Urban Transformation in Auckland, New Zealand. *Geoforum* 41(6), pp. 940–950.
- FINCHER, R. & L. COSTELLO (2005), Narratives of High-Rise Housing: Placing the Ethnicized Newcomer in Inner Melbourne. *Social & Cultural Geography* 6(2), pp. 201–217.
- FINCHER, R. & K. SHAW (2009), The Unintended Segregation of Transnational Students in Central Melbourne. *Environment and Planning A* 41, pp. 1884–1902. <https://doi.org/10.1068/a41126>.
- FOOTE, N.S. (2017), Beyond Studentification in United States College Towns: Neighborhood Change in the Knowledge Nodes, 1980–2010. *Environment & Planning A* 49(6), pp. 1341–1360. <https://doi.org/10.1177/0308518X17698962>.
- FRANZ, Y. & E. GRUBER (2022), The Changing Role of Student Housing as Social Infrastructure. *Urban Planning* 7(4), pp. 457–469.
- GIBB, K. & C. NYGAARD (2005), The Impact of Buy to Let Residential Investment on Local Housing Markets: Evidence from Glasgow, Scotland. *European Journal of Housing Policy* 5(3), pp. 301–326.
- GODDARD, J.B. & P. CHATTERTON (1999), Regional Development Agencies and the Knowledge Economy: Harnessing the Potential of Universities. *Environment and planning C: Government and Policy* 17(6), pp. 685–699.
- GODDARD, J., M. COOMBES, L. KEMPTON & P. VALLANCE (2014), Universities as Anchor Institutions in Cities in a Turbulent Funding Environment: Vulnerable Institutions and Vulnerable Places in England. *Cambridge Journal of Regions, Economy and Society* 7(2), pp. 307–325. <https://doi.org/10.1093/cjres/rsu004>.
- GONZÁLES, S., S. OOSTERLYNCK, R. RIBERA-FUMAZ & U. ROSSI (2018), Locating the Global Financial Crisis: Variegated Neoliberalization in Four European Cities. *Territory, Politics, Governance* 6(4), pp. 468–488. <https://doi.org/10.1080/21622671.2017.1318713>.
- GREGORY, J.J. & J.M. ROGERSON (2019), Studentification and Commodification of Student Lifestyle in Braamfontein, Johannesburg. *Urbani izziv* 30(9), pp. 178–193.
- GU, H. & D.P. SMITH (2020), ‘Living off the Campus’: Urban Geographies of Change and Studentification in Beijing, China. *Urban Geography* 41(2), pp. 205–224.
- HARVEY, D. (2001), Globalization and the ‘Spatial Fix’. *Geographische Revue: Zeitschrift für Literatur und Diskussion* 3(2), pp. 23–30.
- HESLOP, J., J. CHAMBERS, J. MALONEY, G. SPURGEON, H. SWAINSTON & H. WOODALL (2022), Re-Contextualising Purpose-Built Student Accommodation in Secondary Cities: The Role of Planning Policy, Consultation and Economic Need During Austerity. *Urban Studies* pp. 1–18. <https://doi.org/10.1177/00420980221121569>.
- HOCHSTENBACH, C., B. WIND & R. ARUNDEL (2021), Resurgent Landlordism in a Student City: Urban Dynamics of Private Rental Growth. *Urban Geography* 42(6), pp. 769–791.
- HUBBARD, P. (2008), Regulating the Social Impacts of Studentification: A Loughborough Case Study. *Environment and Planning A* 40(2), pp. 323–341.
- JESSOP, B. (2016), Territory, Politics, Governance and the Multispatial Metagovernance. *Territory, Politics, Governance* 4(1), pp. 8–32.
- LI, Z., X. LI & L. WANG (2014), Speculative Urbanisms and the Making of University Towns in China: A Case of Guangzhou University Town. *Habitat International* 44, pp. 422–431.
- MALET CALVO, D., J. NOFRE & M. GERALDES (2017), The Erasmus Corner: Place-Making of a Sanitised Nightlife Spot in the Bairro Alto (Lisbon, Portugal). *Leisure Studies* 36(6), pp. 778–792.
- MANGIONE, E. (2019), Le politiche per la città universitaria: esiti e trasformazioni a Torino. *Atti e Rassegna Tecnica della Società degli Ingegneri e degli Architetti in Torino* LXXIII(2), pp. 161–167.
- MEISSNER, M. (2021), Studentification in Germany: How Investors Generate Profits from Student Tenants in Goettingen and the Impact on Urban Segregation. *European Urban and Regional Studies* 28(2), pp. 133–154.
- MOOS, M., N. REVINGTON, T. WILKIN & J. ANDREY (2019), The Knowledge Economy City: Gentrification, Studentification and

- Youthification, and their Connections to Universities. *Urban Studies* 56(6), pp. 1075–1092. <https://doi.org/10.1177/0042098017745235>.
- MUNRO, M., I. TUROK & M. LIVINGSTON (2009), Students in Cities: A Preliminary Analysis of their Patterns and Effects. *Environment and Planning A* 41(8), pp. 1805–1825.
- NETHERCOTE, M. (2019), Melbourne's Vertical Expansion and the Political Economies of High-Rise Residential Development. *Urban Studies* 56(16), pp. 3394–3414.
- OLDS, K. (2007), Global Assemblages: Singapore, Foreign Universities, and the Construction of a "Global Education Hub". *World Development* 35(6), pp. 959–975.
- PONZINI, D. & M. SANTANGELO (2018), Spatial Strategies Through Land-Use Plans, Urban Projects and Metropolitan Visions: Twenty-Five Years of Planning in Turin. *Town Planning Review* 89(3), pp. 259–283.
- PRADA, J. (2019), Understanding Studentification Dynamics in Low-Income Neighbourhoods: Students as Gentrifiers in Concepción (Chile). *Urban Studies* 56(14), pp. 2863–2879.
- REVINGTON, N. (2021), Age Segregation, Intergenerationality, and Class Monopoly Rent in the Student Housing Submarket. *Antipode* 53(4), pp. 1228–1250.
- REVINGTON, N. & M. AUGUST (2020), Making a Market for Itself: The Emergent Financialization of Student Housing in Canada. *Environment and Planning A: Economy and Space* 52(5), pp. 856–877.
- ROSSI, U. (2015), The Variegated Economics and the Potential Politics of the Smart City. *Territory, Politics, Governance* 4, pp. 337–353. <https://doi.org/10.1080/21622671.2015.1036913>.
- SAGE, J., D.P. SMITH & P. HUBBARD (2012), The Diverse Geographies of Studentification: Living Alongside People Not Like Us. *Housing Studies* 27, pp. 1057–1078. <https://doi.org/10.1080/02673037.2012.728570>.
- SAGE, J., D. SMITH & P. HUBBARD (2013), New-Build Studentification: A Panacea for Balanced Communities? *Urban Studies* 50(13), pp. 2623–2641.
- SEMI, G. & M. TONETTA (2021), Marginal Hosts: Short Term Rental Suppliers in Turin, Italy. *Environment and Planning A: Economy and Space* 53(7), pp. 1601–1608. <https://doi.org/10.1177/0308518X20912435>.
- SMITH, N. (1979), Toward a Theory of Gentrification a Back to the City Movement by Capital, Not People. *Journal of the American planning association* 45(4), pp. 538–548.
- SMITH, D.P. (2005), Studentification: The Gentrification Factory. In: R. Atkinson & G. Bridges, (eds.), *Gentrification in a Global Context: The New Urban Colonialism*, pp. 72–89. London: Routledge.
- SMITH, D.P. (2008), The Politics of Studentification and 'Un) balanced' Urban Populations: Lessons for Gentrification and Sustainable Communities? *Urban Studies* 45(12), pp. 2541–2564.
- SMITH, D.P. & L. HOLT (2007), Studentification and 'Apprentice' gentrifiers within Britain's Provincial Towns and Cities: Extending the Meaning of Gentrification. *Environment and Planning A* 39(1), pp. 142–161.
- SOTOMAYOR, L., D. TARHAN, M. VIETA, S. MACCARTNEY & A. MAS (2022), When Students Are House-Poor: Urban Universities, Student Marginality, and the Hidden Curriculum of Student Housing. *Cities* 124, p. 103572. <https://doi.org/10.1016/j.cities.2022.103572>.
- VANOLO, A. (2015), The Fordist City and the Creative City: Evolution and Resilience in Turin, Italy. *City, Culture and Society* 6(3), pp. 69–74.
- WARD, C. & E. SWYNGEDOUW (2018), Neoliberalisation from the Ground Up: Insurgent Capital, Regional Struggle, and the Assetisation of Land. *Antipode* 50(4), pp. 1077–1097.
- ZASINA, J. (2021), The Student Urban Leisure Sector: Towards Commercial Studentification? *Local Economy* 36(5), pp. 374–390.
- ZASINA, J., E. MANGIONE & M. SANTANGELO (2021), Nuancing Student Geographies: Studentscapes in Post-Industrial Cities. *Urban Geography* 44, pp. 105–127. <https://doi.org/10.1080/02723638.2021.1969142>.