Co-residency of immigrant groups in a diverse inner-city neighbourhood of Whitechapel, London

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Abstract

A single-family occupying one residential unit is the typical residential arrangement in Global Northern cities. However, specific communities tend to practice co-residency, wherein several families share the same residential unit. In this study, we evaluate immigrant groups' co-residency tendencies in London's East End Whitechapel neighbourhood through a door-to-door survey and interviews. We differentiate between horizontal and vertical family structures and find that a sizable percentage (44.4%) of the residential units were shared by two or more families. At the neighbourhood level, we show that the segregated residential pattern of groups was correlated with the pattern of co-residency, indicating that the uneven spatial concentration of ethnic groups led to high densities of families in specific parts of Whitechapel. The interviews reveal that co-residency is not merely a result of economic constraints but also a residential preference reflecting the need for cohabitation with extended family members.

Keywords: Co-residency, Immigrant groups, Cohabitation, Residential behaviour, Private housing, Social housing, Segregation

1. Introduction

Immigration has always been a driving force of cities' growth and development (Hall and Savage, 2016) but it can be stressful and challenging for both the individual and the family. Regardless of the immigrants' place of origin and reasons for relocation, many immigrants face challenges in their host society, including social and cultural isolation, language constraints, and poverty (Katz and Lowenstein, 1999; Longley and Mesev, 2002; Bergan et al. 2020). Immigration challenges their abilities and resources (Katz, 2009), straining inter-family connections and creating conflicts that generate a range of coping strategies (Choudhry, 2001). One such strategy is *co-residency*, a general term used to describe two or more family units occupying the same residential unit (Treas and Mazumdar, 2002; Khvorostianov and Remennick, 2015).

Research on the effects of kinship and social networks' on immigrants' adjustment cites the importance of informal contacts and residency, at least during the initial years of the adjustment process (Aroian et al., 2001; Remennick, 2003). The transition from the extended family orientation to those prevalent in the Global North often sets newcomers on a lifelong course of mutual, financial, and emotional aid that includes periods of co-residency in one or more phases (Bolt, 2002; Lowenstein and Katz, 2005). They are more likely to practise co-residency if they are already familiar with this type of living arrangement from their country of origin (Lowenstein and Daatland, 2006; Yoshikawa, 2011; Tomaszczyk and Worth, 2018). Studies on co-residency have mainly focused on the relationship between individual preferences, socio-economic resources, constraints, opportunities, support networks and the characteristics of the host locale (Mahler et al. 2015; Merla, 2015). Other studies have focused on the effect of chain migration of extended families on today's cities (Reynolds et al., 2010; Brannen, 2016; Tovares et al., 2017). They distinguished between two topologies of extended family households – horizontal (HR), and vertical (VR) – classifying them by the generational relations among adult individuals other than the householder parents and their children (Van Hook & Glick, 2007). HT includes family members from the same generation and age groups or other related lines, while VT consists of a combination of parents, grandparents, and grandchildren of the unit head. Despite its potential impact on the total number of residents and the neighbourhood as a whole, the effects of co-residency on neighbourhoods have received little

attention. This research aims to address the conspicuous absence of high-resolution studies that identify the complex residential dynamics of groups, contending that to examine residential processes, one must refer to the fundamental social structures and values from which affected communities draw their strength. This research shed light on the role of replicating familial patterns from the home country in shaping private space and the effects of HR and VR patterns of co-residency on neighbourhoods' structure. Emphasising the residents' perspectives on co-residency represents an advancement in the state-of-the-art analysis of immigrant residential dynamics in dense inner-city neighbourhoods with wide-ranging implications for informing planning policy. The study focuses on Whitechapel, the first destination for many immigrants to London. Similar to many first-port destinations, the ethnic composition of Whitechapel's population is highly diverse. Based on extensive field survey at the family level and in-depth interviews (2011-2012), we assessed the cohabitation tendencies of families by evaluating the number of families in residential units. Our first aim is to determine whether or not this living arrangement is typical. Our second aim is to evaluate how co-residency differs by immigrants' country of origin and tenure types. We seek to ascertain whether this tendency is a characteristic of specific groups and whether it is practised more in private or in social housing. Our third aim is to examine how uniform the spatial pattern co-residency is and whether it is related to the residential pattern of groups. A segregated pattern of co-residency would concentrate a larger number of families in a small area. Our fourth and final aim is to describe the motivations and experiences of families for co-residing. As this survey offers the only data on co-residency in Whitechapel 's private and social housing, the findings add to the literature on the effects of replicating residential practices from the home country on residential segregation with broader socio-spatial policy implications. The rest of the paper has the following structure: Section 2 presents a theoretical background, followed by sections describing the case study and the methods. The Results section consists of five subsections: Section 5.1 presents the ethnic composition and the overall co-residency tendencies; Section 5.2 presents each group's tendency; Section 5.3 presents co-residency in social and private housing; Section 5.4 describes the residents' perspective and Section 5.5 presents the spatial distribution of co-residency and country of origin. The paper concludes with a discussion and summary.

2. Background

It is widely accepted that individuals' mobility patterns are shaped by a mix of individuals' preferences, opportunities, and constraints (Markkanen and Harrison, 2013; Skovgaard Nielsen et al., 2015; Andersen et al., 2016). The three theories employed in this paper differ in the importance they attach to individuals' choices and constraints, thereby providing different explanations for the existence and maintenance of residential segregation.

According to the behavioural approach, people buy or rent residential units based on their household characteristics, needs, and composition (Adams and Gilder, 1976). The resources available to households – whether material, cultural, or cognitive – determine their ability to overcome residential constraints (Ihlanfeldt and Scafidi, 2002; Wahlstrom 2005). Investigating the constraints that immigrants face may help to explain their disadvantaged positions in their housing careers. Constraints may arise from shortages in the housing market, competition over affordable dwelling, discriminatory practices of landlords or realtors, or even exclusionary policies of local authorities (Özüekren and Van Kempen, 2002; Peach, 2013). In particular, limited social capital and a lack of knowledge concerning the rental queue or the housing allowance systems can undermine newcomers' residential abilities (Wippler, 1990) and compel them to consider low-standard options (Manning and Smock, 2005; Marcuse and van Kempen, 2000).

The ethno-cultural approach, a particular form of the behavioural approach, stresses the element of choice in the relationship between individual preferences and resources, constraints and opportunities and the macro-level socio-spatial structure of the area where people live. Studies on inter-group variations in the housing market found that residential segregation resulting from individuals' choices varies between groups because of cultural differences (Søholt, 2014). Such preferences contribute to upholding the cultural practices, the development of networks for mutual support, and the availability of institutions, or pull them into co-residency (Andersson and Turner, 2014).

Co-residency has been studied from various standpoints, with extensive investigations focusing on the advantages and disadvantages of density and crowding, and its effect on interpersonal bonds

(Netto, 2006). Nonetheless, the multitude of its definitions in various disciplines and under various contexts, and the underlying assumption that co-residency creates overcrowding, blur the meaning of this term (Churchman, 1999). Pader (1998) found that the number of occupants per unit is an indicator of limited means in the US. Søholt (2014) explained that co-residency is not a preference when tenants do not have access to decent dwellings of their own and have no choice but to cohabit in poor and uncertain conditions. Wood et al. (2008) examined the effects of housing vouchers on welfare families and found that vouchers significantly reduced the incidence of living with relatives or friends but had no impact on cohabitation. Studies showed that even when their socio-economic situation improves, some immigrants choose to reside in proximity to other co-ethnics or with their extended families (Crowder et al., 2006; Curtis, 2007; Pais et al., 2012). Therefore, although many immigrants still co-reside in the least desirable housing market segments, crowding and poverty are not necessarily mutual (Bowes et al., 1997; Breheny, 2001).

Two main topologies of cohabitation are common, each with its own set of motivations: horizontal (HT) and vertical tendencies (VT) (Ermisch, 1990). HT includes family members from the same generation and age groups or other related lines (marital and adult sibling). According to the literature, in rural settings where labour-intensive agriculture is a significant source of income, HT ensures that more than one adult male labourer is available to work (Glick et al., 1997; Kamo, 2000). Therefore, HT is prevalent among immigrants from the rural areas of Pakistan, Bangladesh, South Sudan, and Sri Lanka, as it allows dividing costs by a larger number of economically active members (Glass et al., 1990; Khanum, 2001; Crozier and Davies, 2006). VT co-residency includes some combination of parents, grandparents, and grandchildren of the unit head (Ruggles, 1987). Studies show that the motivations for VT differ by ethnicity (Ishii-Kuntz, 2000; Kalavar and Van Willigen, 2005; Fernández and Fogli, 2009). Kalavar and Van Willigen (2005) linked VT to an expression of filial piety among Asian Indians in the US. Bolt (2002) referred it to the desire of Turks and Moroccans in the Netherlands to honour one's ancestors. While Szołtysek (2012) related VT to Lithuanian immigrants' limited resources, Goody (1973) and Yeung (2000) explained it as a strategy to ensure male heirship and organisational structuring of family ownership and control among Chinese. However, as these two types of topologies are not necessarily dichotomic

(Friedrichs, 2013; Vogiazides 2018), we assume that there are also complex households with both lateral and vertical extensions. The diversity of motivations for both HT and VT is consistent with the behavioural approach and, in particular, with the ethno-cultural approach, which considers residential behaviours to be culturally informed. Cultural norms reinforce residential occupancy practices at the household level, leading to differences in social groups' residential occupancy patterns (Musterd and Van Kempen, 2009; Lersch, 2013; Schaake et al., 2014).

The place stratification theory, proposed by Alba and Logan (1993), addresses the residential opportunities and barriers that ethnic groups face in cities. According to this approach, certain location-specific factors, such as prejudice of the majority population and discriminatory practices in the housing market, can prevent certain groups from achieving a more advantageous residential situation and restrict their possibilities for spatial assimilation into the broader society (Clark & Drever, 2000; Wessel et al., 2017; Andersen, 2019a: 141-7). The place stratification theory stress that a growing spatial concentration of immigrants from a particular country can provide the opportunity for other people from that country to have more and closer contacts with their fellow countrymen (Andersen et al., 2016; Andersen, 2019b: 183-7). Thus, both internal processes of congregation and external forces of exclusion, barriers, and discrimination contribute to the formation of ethnic segregation. Therefore, we will employ lessons from the place stratification theory in explaining the reasoning for co-residency and its effect on interpersonal bonds as expressions of how individuals link socio-cultural preferences and resources to constraints and opportunities in cities.

3. The case study of Whitechapel

Whitechapel neighbourhood is located in London's East End (Fig. 1a). The East End developed gradually from medieval times. From around 1890, the area became associated with poverty, overcrowding, disease, and criminality. The closure of the last of the East London docks in 1980 led to regeneration attempts to the south and east of Whitechapel. Subsequently, its proximity to London's financial centre, the strong presence of gentrification and social policy activity have led to much new development in Whitechapel (Kintrea et al., 2008; Dustmann and Theodoropoulos,

2010). Today, Whitechapel is populated by Muslims, Hindus, and Christians of 27 ethnic groups, most of whom identify as second-, third- and fourth-generation immigrants. The largest group, in the Borough of Tower Hamlets is Bangladeshi-Muslims (32%, TH Borough Profile 2018).

(Place Fig. 1 about here)

4. Methods

This study is part of extensive research aimed at examining micro-residential dynamics in Whitechapel (as shown in Fig. 1b). As part of the broader study, a door-to-door survey was conducted between October 2011 and July 2012. Supposed to coincide with the 2011 UK census, the data used is not new. However, this micro-database enables a comparison between stated and revealed preferences and recognises real dynamic processes. It allows General Data Protection Regulation compliance to strengthen residents' data protection while being highly relevant to explain micro-dynamics when Whitechapel infrastructure remained almost steady, yet residential patterns changed. The survey was conducted by the first author and a local interviewer, a young male from the Bangladeshi community who has requested anonymity. As both of the interviewers were familiar with the local communities and spoke Bengali and Arabic, they were able to gather rich data from one of the adults in each family. The response fraction reached 83%.

The interviewers collected data on the units' housing tenure, residents' motives for choosing the unit, their stated preferences, their residential options in the community, and asked for their motivations for co-residency. The semi-structured questionnaire also includes questions about the migration status and country of origin. The interviewer counted the number of families by ascertaining the relationships between the residents. This method enabled us to visit all the 3,186 identified residential units of Whitechapel and to identify the country of origin of each family within each unit.

To better represent the number of families in each unit, we revised the definition of family as it used in the census by combining the "family" and "household" concepts. We consider conjugal

and parenthood relationships of individuals occupying a residential unit to be central to our definition. We use the following definition for counting the number of families in a residential unit:

1. Persons in a conjugal relationship who cohabit in a residential unit are counted as one family. This definition also includes the union of three individuals (e.g., a husband and two wives). Any child of one of the persons is considered to be part of the parent's family as long as the child has no spouse or child residing in the unit. Thus, a couple co-residing with two single adult children with no grandchildren would be counted as one family, while a couple co-residing with a daughter and her husband would be considered as two families.
2. A single parent and her/his single children (who have no children) are counted as one family. Thus, a mother and an adult son with no spouse or children who resides in the unit would be counted as one family.
3. Any other single individual who has family ties with at least one person residing in the unit is not counted as a separate family. We consider such a person to be part of one of the other families. For example, a single woman living with her daughter and her young grandchild is considered to be part of her daughter's family and is thus counted as one family. Single siblings living together without any children and spouses are counted as one family. An uncle living with his niece and her husband would all be considered one family, while the uncle would have formed another family if he were to live with a spouse.
4. Any single person with no family relation to any other person in the unit is counted as one family.

This definition is compatible with Bangladeshi and African families in which a brother and his spouse and children often live with other brothers and their spouses and children (Susuman et al., 2017). The prevalent practice in these families is that a married son brings his wife to his nuclear family, while a woman leaves for her new husband's family. Note that this definition does not contradict the accepted practice in other communities.

Along with this comprehensive survey, 58 one-hour in-depth interviews were conducted with co-residents in Whitechapel of various ethnic backgrounds. The interviews were audio-recorded and written notes were taken during or after the interview. The interview data were analysed using

open-coded thematic analysis. The interviewees provided additional information on residents' perspectives on co-residency, the motivations behind co-residency, the practice of co-residency, the opportunities and challenges they represent, community life, and the assimilation of Western housing values. The interviews took place in the interviewees' offices, cafes, or the eastern area of Altab Ali Park. All participant names have been changed to pseudonyms.

Data analysis was conducted using R (2018). The observed tendency of various groups to share apartments (no. of occupants per residential unit) is compared using the Mann–Whitney U test. Maps were produced using ArcMap 10.6.1, and the Moran's I indices of spatial autocorrelation (Anselin, 1995) were calculated using Geoda 1.12.161.27 (Anselin et al., 2006).

Concerning its limitations, the survey did not include information on the characteristics of residential units (such as area and number of rooms) and families' economic profiles. In each sampled residential unit, the interviewees identified their country of origin as well as the origin of individuals and families that were not present. Thus, some interviewees might have misidentified the origin of others.

5. Results

5.1 Ethnic composition and the overall tendency to share accommodations

Our data includes 2,368 valid residential units in 281 buildings, of which 43 (15%) were social housing buildings. Within the social housing buildings, we surveyed 653 units. The total number of families reported is 4,963. Our survey indicates that families' ethnic composition was quite diverse: 27% of the families identified as Bangladeshi, which was the largest group in the neighbourhood, followed by English (15.5%) and Lithuanian families (6.6%). Table 1 depicts the size of the ten largest groups.

(Place Table 1 about here)

On average, a residential unit was shared by 1.8 families (95% CI [1.79, 1.91]). A sizable percentage (44.4%) of the residential units were shared by two or more families (indicating a median of 1). The proportions of two, three, four, and five families were 22.4%, 12.7%, 5.2% and 2.1%, respectively. 98% of the units had fewer than six families. In line with the behavioural

approach, we found that the co-residency tendency of various groups is consistent with the household characteristics and composition. Nearly all the residential units (99.4%) were shared by families of the same ethnic group. This finding indicates an extreme level of segregation within residential units. However, 13 units were occupied by families and individuals of differing groups. These mixed units consisted almost entirely of European groups such as English, Irish, Scottish, and German.

5.2 The co-residency tendency of various groups

The observed tendency for co-residency varied between the immigrant groups. Table 2 shows the mean and median of the number of families in residential units by group. In these statistics, we exclude the 13 mixed units. We find that Bangladeshi families had the strongest tendency to share units. On average, units occupied by the Bangladeshi group accommodated 3 families. Thus, the Bangladeshi group was both the largest subpopulation (27% of the sampled families) and the group with the most definitive tendency to co-reside. The tendency to co-reside was followed by the Sudanese and Indian groups, which consisted of 2.4 and 2.3 families per unit. Units occupied by Japanese, Scandinavians, Emiratis, and Germans included a single family on average. The distributions of the number of families per unit are shown in Fig. 2. The majority of residential units that were occupied by Bangladeshi, Sudanese, and Indian groups accommodated at least two families. For the Bangladeshi group, 88% of the units were occupied by at least two families, followed by 74% and 69% for the Sudanese and Indian groups respectively. For the rest of the groups, the single family per residential unit was the most frequent configuration. For example, 48% of units occupied by Moroccans included at least two families, and only 14% of English residential units contained more than one family.

(Place Table 2 about here)

(Place Fig. 2 about here)

5.3 Co-residency in social versus private housing

Our analysis suggests an association between co-residency and tenure type. The number of families per unit in social housing was larger than that in private housing. Social housing units were shared on average by 2.0 families, while private units were shared by only 1.78 families (Mann Whitney U test, $p < 0.01$). 64% of social units were occupied by at least two families, while the percentage for private housing was only 37%. This result may appear surprising, as we would expect social housing to be highly regulated regarding the number of families allowed in a residential unit. One possible explanation is that social units are larger than private flats. However, as we already demonstrated, place of origin is a factor that influences the tendency to share dwellings, and our survey shows that the two types of residences had different compositions: The majority of families in social housing identified as Bangladeshi (56%), Moroccans (16%), Lithuanian (14%), and Indian (6%). Units occupied by these groups had a large number of families per unit on average. In private units, English families were the largest group (25%), followed by Bangladeshi (19%), Lebanese (9%) and Japanese (7%). Thus, the percentage of groups that had a large number of families per unit is smaller.

The ability to overcome residential constraints as an outcome of households' resources is consistent with the behavioural approach and help explain various positions in households' housing careers. Our interviews indicate that Bangladeshi families tend to sublet their social housing to Lithuanians. Despite the possible negative effects of subletting to the social housing market in general and for the Lithuanians in particular, this arrangement enabled Bangladeshi families that were eligible for social housing to earn money on rent, while Lithuanian families were able to reside within their community at an affordable price, as each paid less than if living by themselves. In line with the ethno-cultural approach, this practice links individual preferences and resources, constraints and opportunities. While we do not know how many families engaged in this practice, it may have increased the percentage of Lithuanians at the expense of Bangladeshi families. As Lithuanians tend to share residential units with fewer families, this arrangement may have reduced the average number of families in social housing units.

We already showed that the larger number of families in social units was likely related to the higher percentage of ethnic groups that exhibited a strong affinity for co-residency. However, this finding

does not indicate whether specific groups had the same tendency to co-reside in the two types of units. For example, did Bangladeshi families have a greater tendency to share residence in private units? We can address this question by comparing the observed tendency to co-reside between the two types of dwellings for each group separately. Social units were populated mainly by Bangladeshi, Moroccan, Lithuanian, and Indian families. For each of these groups, Table 3 gives the number of families in social and private dwellings. We find that the average number of families in units occupied by Bangladeshi and Lithuanian groups was significantly higher in private units (an average of 3.62 versus 2.44 families per unit for Bangladeshi families). Thus, it appears these two groups shared their units with more families in private housing while contributing to the high number of families in social units because of their large numbers. The opposite result is found for units occupied by Moroccan families, i.e., the number of families was higher in social housing. Note that while the distributions differ significantly, the averages are relatively high for both types of dwellings. For the Indian group, we cannot reject the null hypothesis of similar distributions.

(Place Table 3 about here)

5.4 Residents' perspectives on co-residency

Our quantitative analysis suggests that immigrant groups differed in their respective tendencies to share accommodations and that distinct residential patterns of ethnicity and co-residency existed at the neighbourhood level. To study residents' motivations and perceptions, we conducted interviews with selected individuals of various groups. Bangladeshi residents had the most definitive tendency to co-reside. Uddin, a 31-year-old Bangladeshi man, described co-residency as follows:

'*All the families I know live like us. It's a brother with his wife and their children, another brother with his wife and their children, and so on, all brothers and their families together. If the parents [are] in Bangladesh, then no, but if they are here, then yes, they live with their sons and their families. Sometimes non-relatives of our* samaj *are added with or without other relatives or children. We are all of the same* chula *["cooking pot"], so everyone who is related to me through 'father to son' is my family.*'

Uddin described a horizontal topology (HT) of cohabitation wherein brothers and their families share the same residential unit. This topology may contribute to the large number of families in Bangladeshi dwelling units, as the number of adult brothers can be large. Flora, a 19-year-old Bangladeshi woman, described the motivation for HT:

'*Living together, parents, and all their sons, and their wives, and their children, we are saving a lot. We, the women, work in the market, and every day one of us stays with the children and the grandmother*'.

Flora described the HT as a single, functioning unit that shares resources and effort. Sudanese exhibited the second-strongest inclination to co-reside. Abrar, 19 years old Sudanese women, described the following motivations:

'*I live with my husband, his brothers, and a few more people. All of us from the same village there in Ghaat, so we are all one close family. Every Wednesday, it is my day to look after the children when they all go to work. That's how we save a lot to send back there, and there's always someone to stay with the children. I also might have a child one day. There is no problem with privacy here. I work every day, and here there is running water all day long, and every week I send money to my father.*'

Abrar explained that the HT of co-residency enables her to save and send money to family members abroad. Her description is an example of how co-residency may assist immigrants in managing conflicting economic demands between their new country and their country of origin (Carling et al., 2012).

Uddin, Flora, and Abrar all expressed strong affiliations with their extended family members who reside with them. They accepted HT as the prevalent norm in their communities and did not express any negative aspect thereof. Indians exhibited the third strongest co-residency tendency. Nazneen, 28, woman, a UCL student who identified as Indian, described the following residential experience:

'*I live with my husband, our children, and my in-laws. I moved to their house after our wedding. The mother is disabled now, so I am responsible for her daily care. That's why I'm missing so many classes. You will get a reputation as a deadbeat if you miss too many, but it's my third*

pregnancy, I am so heavy myself, and it is so hard to lift her up. But everyone's got something to say, and I am not the first one to do so. So I have nothing to complain about; I have a very good life. I only need to set a good example for my children by showing them how to respect and be kind to our elders.'

Nazneen described a VT of parents living with one of their male adult children, their daughter-in-law, and grandchildren. The practice of VT by Indians may explain their lower number of families per unit than groups that practice HT. Nazneen accepted the norms associated with VT, but described the challenge of balancing family and professional lives. The norm of co-residency are not accepted by all. Vaj, a 20-year-old Indian man described how his uncle adopted a Western style of residence:

'*I came in June 2010 to stay with my uncle and his wife. They are here for four generations now, so they live only with their children. They say they want to live like the Westerns, with more privacy. They say that they want to give more to each child so [that] the children educated inside, [so] they will not get a bad influence, which can bring* lajja *["shame"] to the family name. But it is much more costly, and they lose the [values of] peace and prosperity that living with your elderly parents provides*.'

Asmaa, a 46-year-old Moroccan woman, described similar views on the adoption of Western residential norms:

'*We are here for eight years now, so we are British and eligible for social housing. They offered us to come here because my husband works as a builder in the borough, so we came to live here. Our children's friends do not live with their grandparents, so sometimes ours [children] find it hard to show respect and accept their grandparents' principles. So I need to accommodate everything, to show gratitude to my in-laws, to serve them, to take care of their health, respect their decisions.*'

Following lessons from the place stratification theory, these accounts support previous research revealing that co-residency is not merely a product of economic constraints, but also a residential preference reflecting the inclination to co-reside with extended family members and their fellow countrymen. They indicate the prevalence of co-residency among selected communities. This

practice describes as deep and rooted, transferred from the villages outside the UK to the western city. Co-residency is part of a broader set of procedures that defines "us" and "others". Individuals and families directly benefit from obeying the group procedure, and there is a cost for non-compliance. It enables a socio-economic mechanism that supports the vulnerable populations, the upbringing of children within the protective family array, and capital distribution.

5.5 The spatial distribution of co-residency

The observed tendency of families to ethnically segregate in residential units is accompanied by a similar tendency to concentrate in buildings and neighbourhoods. For example, Bangladeshi families concentrated in specific buildings and areas, which enabled them to maintain a sense of community. As a result, some buildings and areas had a higher number of families per unit than others. The concentration of Bangladeshi, Sudanese, and Indian families in social housing is an example of that tendency. Fig. 3a shows the percentage of these families in the sampled buildings. The Bangladeshi, Sudanese, and Indian groups showed a strong tendency to share accommodations. We can see that many buildings were occupied mainly by these families, and that the percentages of the three groups were spatially autocorrelated. For example, buildings along Whitechapel High Street (marked “A”) hosted high percentages of these groups, while clusters of lower percentages were found in places such as near Atab Ali Park (marked “B”) and around Wentworth Street in the northern part of the neighbourhood (marked “C”). We can validate our visual impression by quantifying the level of segregation using the Moran’s I index of spatial autocorrelation. By calculating the percentage of units occupied by these groups in each building and defining buildings’ neighbourhoods as their four nearest neighbouring buildings, we confirm that a significant spatial autocorrelation existed (Moran’s $I = 0.47$, $p < 0.01$).

Fig. 3b shows the number of families per residential unit in each of the buildings. As expected, we see that buildings with higher percentages of Bangladeshi, Sudanese, and Indian families had a higher number of families per unit on average. We can confirm this association by calculating the Pearson correlation between the groups’ percentages and the number of families per unit in the buildings ($r = 0.62$. $df = 279$, $p < 0.01$). This residential pattern is not as segregated (Moran’s I =

0.18, $p < 0.01$), owing to inter-group variations in the tendency to share accommodations and the diversity of dwelling types. Preferences for co-residency at the household level affect the larger components of the city - the building and the neighbourhood. This analysis shows how individuals' preferences, resources, constraints, and opportunities influence the residential pattern of Whitechapel. They lead some families to maintain the practice of co-residency at the residential unit level, which in turn, at the building and neighbourhood levels strengthen by the tendency of certain groups to congregate. The outcome of these practices is spatial segregation which is strengthened in social housing. Moreover, these preferences restrict certain groups' possibilities for experiencing spatial assimilation into the broader society, prevent them from achieving a more advantageous residential situation and push them to live in high-density areas.

(Place Fig. 3 about here)

6. Discussion

This article has revealed new, interesting aspects of the relationship between ethnocultural norm of migrant groups` and their effect on the spatial organisation of a densely populated urban area. The neighbourhood of Whitechapel offers a relevant example of the impact of co-residency, both as a social practice and as a response to trends in a modern urban society such as demographic pressure and the sharing economy, on the neighbourhood's structure. The research highlighted the accumulated impact of the relationships between individuals and the group, interpersonal bonds, and residents' perspectives on co-residency at the individual residential unit on the neighbourhood's segregation pattern as a whole.

Consistent with the behavioural approach and based on an extensive door-to-door survey, this study focuses on individual households` characteristics and composition and explains the motivation and reasoning for co-residency. In line with the ethnocultural approach, our research confirms that individuals` preferences can dramatically impact the segregation pattern of residential spaces. At the level of the individual residential unit, we found that co-residency tendencies differed significantly between groups. Groups that practised traditional residential arrangements showed strong co-residency tendencies. The diversity of motivations for HT and VT are culturally informed

and reinforce residential occupancy practices at the household level. Interestingly, we found that certain groups' strong tendencies for co-residency were not restricted to private buildings but were present in social houses as well, even though social housing policy may limit the number of residents per unit. At the buildings and neighbourhood level, our analysis showed that groups with strong co-residency tendencies concentrated in social housing, resulting in a larger number of families per unit than in private units. The concentration of such groups in social housing is one manifestation of a spatial residential pattern that is segregated in and between buildings. The segregated pattern of ethnicity contributes to an uneven concentration of families in various areas of the neighbourhood: Areas with high percentages of Bangladeshi, Sudanese, and Indian families had a high number of families per residential unit, while the numbers were lower in the rest of the neighbourhood.

We complemented the analysis with interviews that elucidated residents' experiences, motivations and reasoning for co-residency and the impact of these accumulated preferences on the city structure. The motivation of residents to prefer, adopt and maintain co-residency was found to be consistent with place stratification theory. The interviewees described the economic advantages of co-residency in the face of the growing pressure on the housing sector and emphasised many socio-cultural benefits, including mutual daily support mechanisms, childcare solutions, and cultural values preservation. There is a direct benefit for the individual/family in obeying the group procedure and transferring the rooted practice of co-residency to the western city. Co-residency provides a close-knit framework to support more vulnerable family members around agreed-upon social norms and interpersonal bonds. These findings support previous studies' arguments that co-residency is not merely a product of limited resources and that co-residents may prefer to share accommodations even when they can afford other alternatives. However, although there is a considerable preference for co-residency, it is possible that this setting prevents certain families from achieving a more advantageous residential situation. Preferences for co-residency at the household level affect the larger components of the city. In terms of assimilation in the wider urban society, larger units, such as extended families that maintain co-residency, are expected to face more difficulties assimilating than nuclear families and individuals. The preference for maintaining

co-residency of large and complex extended family structure - sometimes three families - restricts their flexibility, and therefore their possibilities, for experiencing socio-spatial assimilation into the broader society.

From the studies to date, it is clear that some important gaps in existing literature remain. Ethnic migrants can often be found in disadvantaged positions on the housing market, which may have implications for their integration into the broader society. Groups who practice a VT of cohabitation might be faster to adopt Western residential norms, as the two structures of residence are quite similar. The data did not enable us to estimate the rate at which families adopt Western residential values. The low number of cessation accounts could be explained by selective out-migration of families that abandon the practice. This process may also be related to the low number of those who expressed a negative opinion of co-residency. However, self-justification has likely played a role as well, as some people might make a virtue out of necessity.

Adequate explanations on the constraints they meet and their preferences are necessary for the formulation of proper policy concerning the housing careers of minority ethnic groups and so for the housing market in general.

Consistent with other studies (e.g., Susuman et al., 2017), which provide policymakers, government agencies, and NGOs with a better understanding of family demography, we contend that planning should address residential crowding as an outcome of both preferences and constraints, with a more flexible differentiation between 'good' and 'bad' densities. Building on lessons from the Grenfell Tower disaster, it is crucial for planning to balance residential tendencies with safety.

The high prevalence of co-residency raises a need for more flexible residential units, especially in social housing. Adjusting the features of the units to the population for which it is intended – which can be larger for specific population groups and smaller for others – with an in-depth understanding of respective groups' needs and preferences, can reduce the level of negative crowding. Meeting occupants' needs through planning solutions while also reducing the number of families in residential units can reduce the negative implications of crowding. Such policies could promote better use of infrastructures and affect the entire urban matrix as well. Co-residency's implications could be relevant to other dense urban areas where relatively mixed dwelling types house a wide

variety of occupants. As groups with higher numbers of families per unit tend to concentrate in specific neighbourhoods, we could expect this mechanism to operate in multi-cultural urban hubs due to people's needs to feel comfortable in their residential surroundings. Further research may reveal the degree to which co-residency is a more general mechanism for neighbourhood change.

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