Tolerant to ethnic diversity, intolerant to intolerance
Title to define

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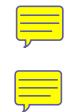
Abstract

Introduction

Residential segregation can be defined as the unequal and non random distribution of people belonging to different groups within the spatial units of a city (E. Bruch and Mare 2009; Clark and Fossett 2008). Ethnicity has long been a main dimension of segregation, both as indicator of in-group/out-group relations and for its correlation with deprived neighborhoods (Van Ham et al. 2012). Nevertheless, in modern societies members of the same ethnic group can positionate differently on the continuum between integration and segregation, due to many reasons. In this paper we focus on the possible mechanisms that underlying hybrid scenarios of residential segregation focusing on two factors, i.e. heterogeneity for ethnic preferences within and between groups, and preferences for like-minded people who share the same conservative or integrationist attitudes. We advocate for usage of agent-based modeling and proceed by extending previous work on Schelling's model of residential segregation.

A simple but long-standing mechanism used in literature to explain ethnic concentration is that of spatial sorting or homophily preferences (Mägi et al. 2016; Müller, Grund, and Koskinen 2018), i.e. the tendency to aggregate with people of the same ethnic group (McPherson, Smith-Lovin, and Cook 2001) . Although ethnic segregation is still considered a relevant issue, especially for modern and diverse societies the simple ethnic homophily assumption might not be that influential, and it should be included within more complex dynamics (Alba 2014). First of all, a growing concept in literature is that of superdiversity that characterizes western societies (Crul 2016), as effect of social mobility, inner-neighborhoods migration flows and multicultural households (Neal and Vincent 2013; Albeda et al. 2018). Out of many ethnic groups cohabiting in the same city, segregation might imply more than a binary definition between in-group/out-group and tolerance toward diversity become critical to social cohesion (Dragolov et al. 2016; Clark, Andersson, and Malmberg 2018; Vervoort, Flap, and Dagevos 2011). Furthermore, people belong to many and overlapping categories (Roccas and Brewer 2002) that can prevail that of ethnicity in defining residential preferences as well as similarity in spatial sorting (Gent, Das, and Musterd 2019). Indeed, literature is most unanimous that in the last decades socio-economic segregation has increased at faster rates than racial-ethnic segregation which is generally decreased (Clark 2002, 2015a). Finally, people within the same ethnic group or social class can vary in their preferences, and differences in affordability give rise to more variegated scenarios (Andersson et al. 2007). In sum, in super-diverse societies ethnic segregation has become a hybrid and complex phenomenon, where ethnicity correlates with other dimensions and people of the same ethnic membership can experience different degree of segregation/integration.

In this paper, we focus on two concepts associated with ethnic segregation in diverse societies when considering relocation choice, i.e. heterogeneity in ethnic preferences, and preferences for other dimensions that can interact with ethnic membership. As for heterogeneity in preferences, it is intuitive that people of the same group might differ in their preferences (Hess, Daly, and Batley 2018), this can increase when other subdivisions as socio-economic class are taken into account (Bruch 2014; Friedman et al. 2019). Considering the context of multi-ethnic societies, difference between social groups are relevant. Some groups might be innerly more tolerant towards minorities, with consequences on inter-ethnic contacts (Bourhis et al. 1997) or they might be likely to blur the boundaries towards specific groups as effect of their cultural similarities (Albeda et al. 2018). On the other side, tolerance towards ehtnic minorities of citizens can result from the multicultural or assimilationist policies adopted by different governments

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(Weldon 2006). As for different preferences that could interact with the dimension of ethnicity, the perspective of ethnic boundary making is relevant. This theoretical framework focuses on the dynamic and symbolic boundaries that distinguish between "us" and "them" (Bail 2008), built by individuals in the continuous and different forms of interaction between groups (Wimmer 2013). The core of ethnic boundary making is to understand how boundaries between in-group and out-group are socially constructed above the categories of ethnic membership, and not as a rigid consequence of them (Esser 2010a; Wimmer 2013). Following this perspective, a taste for ethnic and cultural diversity can serve both to blur ethnic boundaries and to define similarity with other people despite their ethnic membership. Blokland and Van Eijk (2010) show how people who like diversity tend to live in ethnically integrated neighborhoods with other people who like diversity as well. Gent, Das, and Musterd (2019) use similarity for socio-cultural dispositions (i.e. gender balance in household tenure) as predictor to leave the neighborhood, compared to ethnic membership and income similarity, with socio-cultural dispositions resulting more influencing depending on the social class of inhabitants. As people who like diversity can distinguish ethnic diversity of neighborhood from the concentration of people who share the same tastes and show independent appreciation for both (Blokland and Van Eijk 2010; Clark, Andersson, and Malmberg 2018), so people who prefer ethnically concentrated neighborhood can consider an additional value to live close to other ethnically conservative people. The overlap of these two preferences can have consequences on the different scenarios of segregation. Since we are focusing on a spatial sorting mechanism, relative group sizes remains a critical factor. Blau (1977) defines relative group sizes as the structural conditions that can influence inter-ethnic relations, not matter what socio-psychological drivers guide such interactions. Minority groups are per definition more at risk of incorporation from the majority (Esser 2010b). Considering the overlap category between ethnicity and taste for ethnic diversity, the concept of relative group size becomes much complex. For instance, a person might belong to the ethnic minority group, but to the majority of tolerant people in the broad society. Different distributions of people along the categories of ethnic membership and preferences for diversity/homogeneity is noteworthy.

Assuming the critical factors of heterogeneity towards ethnic preference, preference for people who share similar values or preferences and relative group sizes, the questions is opened on how they interact to shape hybrid scenarios of segregation for members of society. To this aim, we advocate the usage of social complexity and agent-based modelling. Differently from theories as spatial assimilation and place stratification centered on individual strategies of movers and stake holders, social complexity would focus on residential segregation as a complex and dynamic phenomenon that emerges from the interaction between residential movers and the constraints to their action (Huang et al. 2014; Schelling 1971; Clark 2015b). The study of similar phenomena requires agent-based computer simulations where such interactions can be implemented and experimented on, to the aim of formalizing mechanisms underlying emergence of macro phenomena (Macy and Willer 2002; Gilbert and Troitzsch 2005). In particular, we build our work upon Schelling's model of residential segregation (Schelling 1971, 1969). Fitting the homophily hypothesis, Schelling described a scenario where people stay in a neighborhood as long as the proportion between similar ones and others is not less than a desired threshold, leaving to a random relocation otherwise. Given the spatial constraints to relocate, e.g. unavailability of empty places due to density of population, the interplay of people pursuing the same behavior can cause high level of segregation even for low thresholds. The original Schelling's model has received interest from scholars outside of computational methods due to its contribution to understanding segregation dynamics (Clark 1991; Clark and Fossett 2008), as well as numerous extensions and studies by complexity scholars. We want to contribute to those studies focusing on random utility models for discrete choice in Schelling's dynamics and ethnically diverse scenarios. Simply stated, discrete choice models allow to deduce prerefernces in utility by observing the difference between neighoborhood chosen and alternative ones (Train 2009; Frankhauser and Ansel 2016). Among regression models for the execution of random utility models, McFadden (1994)'s conditional logit allow to estimate the parameters of utility for different characteristics of neighborhoods (β parameters) and sort them according to socio-demographic characteristics of movers (Boschman and Van Ham 2015). Zhang (2004) was among the first to implement the conditional logit within Schelling's dynamics, although Bruch and Mare (2006) moved forward by matching discrete choice of agents with parameters calculated from empirical data, along with a continuous linear function instead of Schelling's threshold. Despite pitfalls in the code implementation of their model (Van de Rijt, Siegel, and Macy 2009) and consequent corrections (E. E. Bruch and Mare 2009), extensions resulted in agents being more sensitive to fine-grained change in neighborhood ethnic composition. Adopting a similar discrete choice method would benefit the chance of the model to disentangle the relative effect of different preferences. Xie and Zhou (2012) extended the model by E. E. Bruch and Mare (2009) to reflect the heterogeneity in whites' tolerance towards blacks in US, both as categorical classes with different threshold preferences each, and continuous heterogenous preferences. In both cases heterogeneity

between agents, and a class of agent indifferent to ethnic composition resulted in less segregated scenarios due to mutual adaptation of agents. Though not with discrete choice models, Hatna and Benenson (2014) focused on heterogenous preferences between groups, using an increasing linear function until the desired proportion, and dividing each ethnic group in two subgroups of agents more tolerant and less tolerant due to difference in ethnic threshold. The combination of a different utility function and heterogeneous preferences between groups for ethnic thresholds generated hybrid scenarios of integration and segregation. With a different focus of tolerance towards diversity, Paolillo and Lorenz (2018) investigated the interaction of different homophily preferences in Schelling. Keeping threshold behavior as in the original model, they split the population into intolerant ethnic-oriented agents, defining similarity based on shared ethnicity, and tolerant value-oriented agents defining similarity on shared values for tolerance, and explored their adaptation in different conditions of relative group sizes. The introduction of value-oriented agents decreased ethnic segregation compared to the original model. The main discover was a spillover effect for ethnicity-oriented agents in the minority condition who found attractive ethnically mixed neighborhoods formed by value-oriented agents, because of availability of ethnically similar ones, until the point that their concentration caused value-oriented to leave. It can be noteworthy to extend the intuition of Paolillo and Lorenz (2018) for different homophily preferences to the scenarios of heterogeneity as presented by Xie and Zhou (2012) and Hatna and Benenson (2014) and within the framework of discrete choice and linear utility function as in @E. E. Bruch and Mare (2009) which is consistent with utility maximization.

In sum, in this paper we propose a Schelling-type agent-based model to identify possible mechanisms that can explain hybrid segregation in modern and diverse societies, i.e. the scenario where some members of the same ethnic group are ethnically integrated while others are ethnically segregated. We focus on a discrete choice model of homophily preferences for spatial sorting to explain such a scenario. We include similarity based on ethnic membership and on shared values towards ethnic diversity or ethnic conservatism. The expected advantage of this choice is on the consequences it can have on inner cohesion of groups together with the blurry of boundaries between groups. That is, we model scenarios where both intolerant ethnicity-oriented agents and tolerant value-oriented agents share ethnic preferences and value preferences at some degree. While ethnic preferences would consider as similar members of the same ethnic group despite their value-orientation, members of the same ethnic group with different values would be excluded from the value spatial sorting of agents, in favor of members of the out-group with similar values. We will impose as condition that ethnicity-oriented agents hold higher ethnic preferences than value preferences and vice versa for value-oriented agents. We include relative group sizes for both categories of agents as constraints to neighborhood composition and heterogeneity for both preferences within groups and between groups. Additionally, the case of a more conservative group over another can be included. The contributions of the paper are that, compared to previous studies that focused on heterogeneous preferences for ethnic composition (Xie and Zhou 2012,:@hatna2014combining), the interplay of ethnicity and values introduced by Paolillo and Lorenz (2018) may shed deeper insights on the continuum between integration and segregation at the spatial scale. Moreover, not only hybrid segregation would be explored, but also the new form of value segregation and its relation to ethnic segregation, which might serve to describe the sorting of people in diverse societies. The application of random utility models might facilitate the match with quantitative estimate parameters of preferences.

Model

The model[1] was built in NetLogo 6.1.0 and extends work by Paolillo and Lorenz (2018). Agents interact on a regular grid 51 times 51 with periodic boundary conditions (torus world). Each node of the grid can host 1 agent or being empty. Agents represents individuals who relocate and are defined by two static and overlapping variables: ethnicity and value orientation. Ethnicity is modeled through color tag. Agents with blue color represent the local population, agents with orange color represent the minority group. Value orientation through shape tag.

We define value orientation as the common membership of agents sharing same beliefs, preferences etc. potentially subject to change and independent of their attributed ethnicity. As such value orientation relates to value homophily compared to ethncity related to ascribed status homophily. Each agent hold a preference for the ethnic composition and the value composition of each neighborhood. Neighborhoods are defined as a Moore distance. At each step, an agent randomly selected compares its current location to a number of alternative ones, calculates utility for each and decides which location they prefer.

$$\beta_e^{\square} \geq \beta_e^{\circ}$$

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[1] The model can be found here:https://github.com/RoccoPaolillo/ethnic-value_multinomial.git
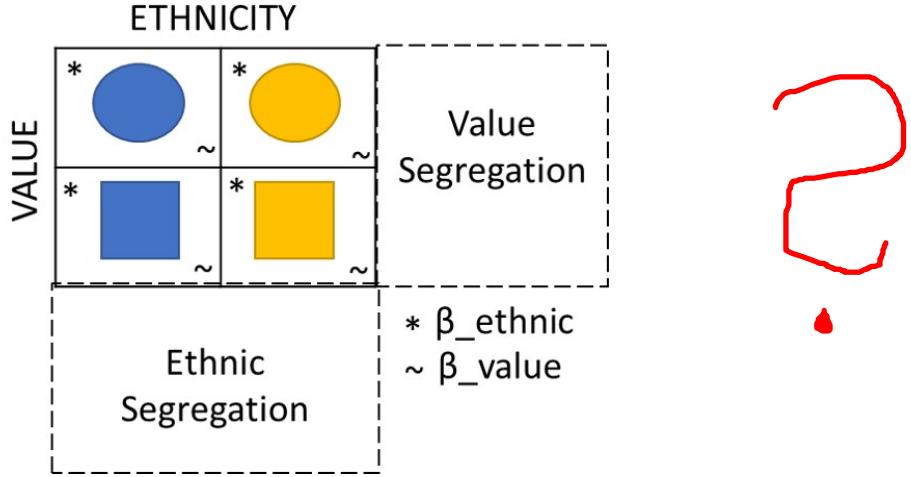
Figure 1: Draft of agents attribution and emerging segregations, to revise.

Experiments

Study 1: heterogeneity of ethnic preferences in agents

- 1.1 Tune β_e for all agents, with condition $\beta_e^{\square} \geq \beta_e^{\circ}$, no difference between agents
- 1.2 Change β_e between groups (supported by literature on which group is going to be more conservative, or anyway argumented). Observe the emergence of ethnic segregation first
- Same conditions, increase β_v Either with first 1.1 and then compar, either compare first the effect of ethnic preference heterogeneity between groups over within group In both cases, the effect of relative group sizes

Hatna, Benenson, and others (2015): in previous studies, they had a "F critical", maybe we could use on the critical β?

The concept of heterogeneity is reflected into the experiments:

- individual: $\beta_e^{\square} \geq \beta_v^{\square}$, $\beta_v^{\circ} \geq \beta_e^{\circ}$
- within ethnic group: $\beta_e^{\square} \geq \beta_e^{\circ}$, $\beta_v^{\circ} \geq \beta_v^{\square}$, should specify the ethnic group
  NO * between ethnic group: $\beta_e^{\square B} \geq \beta_e^{\square R}$ (and implying $\beta_e^{\square B} \geq \beta_e^{\circ R}$) NO

These are the conditions kept in the experiments, ranging $\beta \in 0, 10$
Think about it.
If a society is "conservative", the less ethnic-oriented of that society/scenario would have high level as well. In the end, you could narrow down so to have 3 conditions for each low, medium, high beta (e.g. 1, 5, 10), and calculate the β_e of less ethnicity-oriented agents out of a ratio, e.g. min n/n, $n/(n:2)$ (check), max $n/1$

- 1 = 1,0.5,1 (check)
- 5 = 1,2.5,5
- 10 = 1,5,10

Dependent measure:

- ethnic segregation exposure as Schelling (color)
- value segregation exposure as Schelling (shape)
- C index in Hatna and Benenson (2012), to check

beta-binomial distribution? Discrete values deriving from beta distribution but not limit [0,1] Hatna, Benenson, and others (2015)

Results

Conclusions/ further ideas

Gent, Das, and Musterd (2019) introduction: social homophily as due to preferences and constraints' approach. They also use social class as proxy for socio-cultural differentiation

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