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# The urban class structure: class change and spatial divisions from a multidimensional class perspective

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## ABSTRACT

Social class plays a central role in understanding the urban structure, yet its conceptualization and operationalization in urban studies are limited. We have used the Bourdieusian conception of social class, which conceives of class as the possession of economic, social and cultural capital, to establish the class structure of Rotterdam. We make a theoretical contribution to the literature by discussing how this conception provides new insights into the professionalization-polarization debate. Furthermore, we examine the spatial distributions of different class fractions, known as the geography of class. Based on two waves of a comprehensive city survey, we applied latent class analysis to develop an elaborate class typology consisting of seven social classes. We investigate how the class structure developed between 2008 and 2017 and analyze the changes in spatial class divisions. Our findings show that the transformation of the class structure is mainly driven by changes in cultural capital, that is, middle classes with high cultural capital replacing lower and middle classes with low cultural capital. Spatial analyses further reveal that classes are dispersed in specific ways and that these patterns of dispersion change over time. Finally, we reflect on the relevance of Bourdieu's work in studying the urban class structure

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## Introduction

Research on the social structure of the city and its spatial divisions has a longstanding tradition in the social sciences. Classic examples are works by Du Bois (1899) and Warner and Lunt (1941), who conducted comprehensive studies that captured many social and spatial dimensions of race and class in American cities. Nowadays, with the abundant availability of different kinds of data, several ways of studying the urban structure have become possible (Parker et al., 2007). In this study we focus on social class as a central and multidimensional concept for understanding the urban structure, a sociological perspective that has been relatively absent in urban studies until now (Boterman et al., 2018; Cunningham, 2019; Ljunggren & Andersen, 2015).

Social class is understood here as the possession of economic, social and cultural capital (Bourdieu, 1984, 1986), a conceptualization that follows from the field of “cultural

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class analysis” (see Devine & Savage, 2005; Flemmen, 2013; Savage, Warde et al., 2005). One powerful argument for bringing social class into research on urban structures is that “traditional” measures such as income or employment provide a limited perspective on the urban structure and spatial divisions (Ljunggren & Andersen, 2015). Social class research shows that people with similar economic positions may widely differ in their social and cultural orientations (e.g. Bennett et al., 2009).

This heterogeneity in especially the middle class has spatial manifestations as well, as different middle-class fractions have diverging residential orientations (Bacqué et al., 2015; Boterman & Musterd, 2017; Boterman et al., 2018; Bridge, 2006; Butler & Robson, 2001; Savage, Bagnall et al., 2005). Lower classes, on the other hand, are usually more restricted in their residential options, which may result in spatial concentrations (cf. Slater, 2013). The links between class and geography have been investigated in multiple other studies (Cunningham, 2019; Cunningham & Savage, 2015, 2017; Hanquinet et al., 2012; Ljunggren & Andersen, 2015; Préteceille, 2007; Savage et al., 2015a, 2018). These studies used different conceptions and operationalizations of class (e.g. occupation or a multidimensional measure), whereby only some studies examine the complete urban structure (e.g. Savage et al., 2015a) while other studies focus on issues such as elite formation (e.g. Cunningham & Savage, 2015). Moreover, the role of cultural capital has been relatively neglected in research on class and the changing urban structure, an issue we will further address in this study.

A related aim of this study is to link social class research to literature on the socio-economic structure of urban areas. The latter mainly centers on the debate whether cities have become more polarized (Sassen, 1991) or professionalized (Butler et al., 2008; Hamnett, 1994) and the spatial implications of this (Musterd et al., 2017). We seek to enrich this literature by showing that polarization and professionalization take on somewhat different meanings when social class is considered (cf. Pratschke & Morlicchio, 2012).

One reason why few studies on urban structures have explored issues of social class is the lack of appropriate data. Occupational class is the most common indicator of class and is often operationalized using class schemes with broad class categories (see Lambert & Bihagen, 2014). These broad occupational categories are, however, limited in predicting cultural preferences (see Savage et al., 2013) and do not adequately capture precarious forms of employment or underemployment, such as people working on part-time and zero hours contracts (Payne, 2013). Our dataset offers a unique opportunity to overcome some of these limitations. We use two waves, 2008 and 2017, from the Rotterdam Neighborhood Profile survey to examine the city’s class structure and how it changed in this period. The survey contains 10,686 and 15,215 respondents per wave and is representative at the neighborhood level, thus making comparisons at this level feasible.

This study aims to address three questions concerning social class in Rotterdam. First, what does the class structure look like when we conceive of class as the possession of economic, social, and cultural capital? Second, how did this class structure change between 2008 and 2017? And finally, what are the spatial manifestations of this class structure and how did they change during this period? In the theoretical framework we explicate Bourdieu’s theory of social class and how it has been used to establish class structures. We argue that this conception of class may advance the professionalization-polarization debate. Next, we discuss developments in socio-spatial divisions and how

they relate to the geography of class. These insights are then compared to our case in this study, i.e. Rotterdam. The subsequent section describes our data and method and thereafter, the results of the latent class analysis and spatial analysis are presented. In the final section, we provide explanations of our findings and discuss the implications and limitations of this study.

## Theoretical background

### ***The relevance of a multidimensional conception of social class for the professionalization-polarization debate***

The definition and relevance of social class have been extensively debated throughout the history of sociology. Recent contributions argue that in the past twenty years social class analysis has experienced (yet) another revival (e.g. Savage et al., 2015a). This reemergence of class analysis can largely be attributed to the development of cultural class analysis, a field of research that considers cultural aspects, such as identities and lifestyle practices, pivotal for class analysis – next to the traditional emphasis on the economic nature of social class (Devine & Savage, 2005; Flemmen, 2013; Savage, Warde et al., 2005). Cultural class analysis strongly relies on the writings of Pierre Bourdieu and adopts several of his key concepts such as “capital”, “habitus”, and “field” (Bennett et al., 2009). This field of research deviates from traditional accounts of social class, which view employment relations (Goldthorpe, 2000) or the social relations of production (Wright, 1985) as being central to class analysis (see Crompton, 2008).

Bourdieu (1984, 1985, 1987) viewed social classes as positions that agents can occupy in the “social space”, where this position is determined by the *volume* and *composition* of capital. “Capital” is accumulated labor in the widest sense and thus varies both in volume and composition. Volume refers to the possession of a certain amount of capital and composition concerns the different types of capital. Generally, three types of capital are distinguished: economic capital (wealth and income), social capital (contacts and connections which allow people to draw on their social networks), and cultural capital (the ability to appreciate and engage with cultural goods, and credentials institutionalized through educational success) (Savage et al., 2013, p. 223; see also Bourdieu, 1986).<sup>1</sup> Capital works in different ways in various fields and has varying potential for accumulation and convertibility (Savage, Warde et al., 2005, p. 40).

Bourdieu introduced the idea of “social space” to locate agents in the class structure, which is heuristically presented by having capital volume on a vertical axis and capital composition on a horizontal axis (see Bourdieu, 1984, pp. 128–129). In this scheme economic and cultural capital are the main ordering principles of both capital composition and volume, as their relative weight and possession determine the potential for domination in certain fields. The kinds of capital, like the aces in a game of cards, are powers that define the chances of profit in a given field (Bourdieu, 1985, p. 724). An agent’s position in the social space thus signifies to what extent one may dominate another agent who occupies an opposite position in this space, depending on how the capital properties can confer strength, power and profit on their holder. The social space should thereby be viewed as continuous without any clear-cut boundaries between class positions (Bourdieu, 1987).

Many researchers have used this model of the social space to study the class structure in different contexts (e.g. Flemmen et al., 2019). Others have diverged from Bourdieu's model of social space, which is methodologically based on multiple correspondence analysis, to determine the class structure (Custers & Engbersen, 2020; Savage et al., 2013; Waitkus & Groh-Samberg, 2019). Instead of mapping class positions onto a two-dimensional space, these studies developed class typologies to identify and accentuate certain divisions within the class hierarchy. In this way the volume and composition of capital – i.e. people's capital portfolios – can be more easily quantified, which potentially provides more insight into class-specific strategies (Waitkus & Groh-Samberg, 2019). Savage et al. (2013) exemplify how typologies can illuminate capital portfolios by showing that classes can strongly differ from each other – the elite versus the precariat – while also providing insight into class fragmentations in the middle segment. Typologies may therefore reveal certain “ideal type” classes (in the Weberian sense) that would remain invisible when continuous scales of stratification are used (cf. Flemmen, 2013; Hagenaars & Halman, 1989).

These class typologies, which are constructed using latent class analysis, have been criticized in general for their limited predictive power (e.g. Mills, 2014) and for excluding questions of “power” and “domination” in class analysis (e.g. Skeggs, 2015). Ideally, class typologies should therefore not only provide a model of the class structure that is theoretically plausible, but also clarify the nature of class *relations* (Bradley, 2014). In our analysis we therefore delineate how class relations become manifest through changing spatial divisions.

Bourdieu's view on social class adds a valuable perspective to the field of urban studies in which quantitative studies generally rely on the notion of “socioeconomic status” (Hanquinet et al., 2012; Ljunggren & Andersen, 2015; Van Gent et al., 2019). Socioeconomic status tends to fuse economic, cultural and social elements, and is frequently used in the form of some hierarchical scale that is insensitive to the multi-layered nature of stratification (Flemmen et al., 2019). Using social class as a multi-dimensional concept – i.e. capital portfolios – gives us a better grasp of the nature of stratification as economic, cultural, and social aspects are treated as separate elements. Social class can therefore enhance the professionalization-polarization debate as studies in this field differ greatly in their indicators of socioeconomic status. When discussing processes of professionalization or polarization indicators such as income, employment and education are used interchangeably, which creates ambiguity as to how the urban structure is actually developing (Hamnett, 2001; Nørgaard, 2003; Pratschke & Morlicchio, 2012).

The topic of polarization and professionalization has been the subject of a long-standing debate in urban literature about whether large cities have become more polarized (Sassen, 1991) or professionalized (Butler et al., 2008; Hamnett, 1994). Polarization refers to a process whereby global economic restructuring creates high-end jobs in business sectors such as finance, accountancy and ICT, which in turn leads to an increase in jobs at the lower end of the urban labor market (e.g. cleaning or food service industries) (Sassen, 1991). Accordingly, the number of jobs in the middle segment of the urban labor market declines at a relative rate, thus creating an overall polarized structure (cf. Goos et al., 2014). Professionalization, on the other hand, entails the continuous upgrading of the labor market structure. Since the majority of jobs in post-

industrial labor markets require a higher level of professional skills through education, lower-end jobs are gradually replaced by middle-class jobs. The implication is that the urban structure does not become polarized, but more middle class instead (Hamnett, 1994).

It is difficult to generalize about which of these processes is more dominant. As mentioned above, the choice of indicators matters. Although the professionalization-polarization debate initially revolved around the occupational structure, academics also started to use other social indicators such as income and education (Nørgaard, 2003; Pratschke & Morlicchio, 2012). The 2008–9 recession also drew attention to the growing wealth inequality in recent decades, as the relative share of wealth has grown among the upper classes (e.g. Piketty, 2014; Savage et al., 2015a). The urban literature shows how processes of socioeconomic transformation are contingent on several factors, such as welfare state arrangements, housing policies, variation in the structure of local economies, forms of gentrification, demographic changes, and migration (e.g. Burgers & Musterd, 2002; Lees et al., 2008; Van der Waal, 2010; Van Kempen & Marcuse, 1997; Van Kempen & Murie, 2009). Thus, the type of social indicator and local context are pivotal in assessing processes of polarization and professionalization.

The relationship between these two processes on the one hand and social class on the other is complicated because from a Bourdieusian perspective, no clear hierarchy exists, especially in the middle segment of the class structure (Crompton, 2008; Savage et al., 2015a, 2013). Theoretically, if the share of classes with a very high capital volume (elite) and a very low capital volume (precariat) increases, we could speak of class polarization. On the other hand, if classes with very low volumes of capital decline whilst the share of various middle classes simultaneously increases, then this change could be called professionalization. Yet if we follow the model by Savage et al. (2013), some possible changes in the class structure might be difficult to characterize as either polarization or professionalization. For example, if the “technical middle class”, a middle class with relatively high economic capital but low social capital, were to increase at the expense of the “new affluent workers”, who are higher on social capital but lower on economic capital, we would have a class upgrade from an economic capital perspective but a downgrade in terms of social capital – assuming that other class shares remain equal.

### ***Geographies of social class***

The spatial consequences of socioeconomic transformation in urban areas have been extensively researched (e.g. Andersson & Hedman, 2016; Hochstenbach & Musterd, 2018; Hochstenbach & Van Gent, 2015; Maloutas, 2007). What can generally be deduced from studies on socio-spatial divisions is that, for the past two decades, socioeconomic segregation has been on the rise in both Europe and the US (Bischoff & Reardon, 2013; Musterd et al., 2017), although the local context remains decisive (Maloutas, 2007).<sup>2</sup> The 2008–9 recession is likely to have exacerbated economic inequalities and segregation within urban areas (Andersson & Hedman, 2016; Zwiers et al., 2016). Higher socioeconomic groups have become more concentrated in affluent neighborhoods and vice versa. Empirically, segregation by affluence is a particularly prevailing process (see also Atkinson & Flint, 2004). That is, the rich are increasingly segregated compared to other socioeconomic groups.

Although related, research on the geography of class demonstrates how patterns of class residence do not necessarily follow established patterns of socioeconomic dispersion (e.g. based on income) (e.g. Hanquinet et al., 2012; Van Gent et al., 2019). This literature mainly focuses on the different spatial orientations of middle-class fractions, whereby occupation is the most widely used indicator of social class. A general finding is that the “cultural” middle class (e.g. journalists, academics, architects) tends to have a stronger urban orientation than other middle classes (Boterman & Musterd, 2017; Boterman et al., 2018; Ley, 2003; Ljunggren & Andersen, 2015; Préteceille, 2007). Cultural capital, particularly a preference for the urban esthetic, serves as an important explanation for this pattern, as is the proximity to cultural amenities such as museums and theaters (Bridge, 2006; Butler & Robson, 2001; Savage et al., 2018). The role of cultural capital is further highlighted by Cunningham and Savage (2017), who show that occupational groups living further from the center of London possess less cultural capital on average than their counterparts living closer to the center. Geographies of social class can, however, strongly vary between urban contexts. As Bacqué et al. (2015) argue, the middle-class geographies of Paris and London are very distinct as a result of the infrastructure (public transport), physical aspects (historical development), symbolic places, and the role of the state in both cities. Furthermore, research on middle-class geographies is often closely linked to gentrification (see Lees et al., 2008), referring to the process where middle classes move into formerly working-class neighborhoods at the cost of the original residents.

Next to the focus on middle-class geographies, attention has also been paid to the relation between “elites” and space (e.g. Burrows et al., 2017; Cunningham, 2019; Cunningham & Savage, 2017; Toft, 2018). This research generally shows that individuals who possess a high amount of capital – economic, cultural, and social – occupy exclusive spaces in global cities that segregate them from other classes. The process by which these elites create exclusive spaces is known as “super-gentrification” (Butler & Lees, 2006). Middle and elite classes thus have distinct geographies, depending on the urban context and class fractions. The implication is that class segregation and geography, especially from a cultural perspective, are more complex than socioeconomic segregation, which underlines the need for more differentiated geographies that can shed light on contemporary urban inequalities (cf. Davidson & Wyly, 2012; Hamnett & Butler, 2013).

### ***The case of Rotterdam***

In this paper we investigate how these insights about the urban structure and spatial divisions apply to the Rotterdam context. Rotterdam is the second city in the Netherlands (over 630,000 inhabitants) and has a highly mixed population in ethnic and social terms (Engbersen et al., 2019). The city is usually characterized as a harbor city that is struggling with its transition into a modern service economy (Burgers & Musterd, 2002) and coping with a negative reputation of being the poorest, most unsafe and most “colored” (Van Eijk, 2010). Yet, we observe that this narrative about Rotterdam is changing. These days Rotterdam is generally considered as an attractive place to live and visit. A large increase in housing prices, particularly in and around the city center, reflect the city’s increasing popularity. Between 2015 and 2018 the average market price of owner-occupied houses

in Rotterdam rose by 39%, compared to the national average of 23% (Statistics Netherlands, 2019).

Rotterdam has undergone several sociodemographic and labor market changes in the past few decades. Three structural trends characterize these changes: increasing flexibilization, occupational polarization, and a rising level of education (De Graaf, 2018; Van der Aa et al., 2018). Both temporal employment and self-employment increased by 15% and 38% respectively: combined they mainly account for the total growth in jobs between 2009 and 2016. Furthermore, the largest increase in jobs was on the highest level – professional occupations involving highly complex tasks – and a smaller increase was on the bottom level – elementary and routine occupations involving simple tasks. The number of jobs in the middle segment declined – semi-routine and intermediate occupations – indicating that the occupational structure polarized during the past decade (see Van der Aa et al., 2018). The final trend, educational upgrading, is also marked: whereas in 2008 respectively 43% was low educated and 21% was highly educated, in 2017 34% was low educated and 27% was highly educated (De Graaf, 2018). These trends reveal a peculiar pattern. Even though the population of Rotterdam has become more highly educated and has been upgraded in occupational terms, forms of precarious work are also on the rise (i.e. temporal employment and self-employment). Rotterdam has also become more ethnically diverse. The percentage of people with a migration background rose from 40% in 2000 to more than 50% in 2017 (Scholten et al., 2019). Among the new migrants arriving in Rotterdam, a substantial share can be classified as knowledge workers (see Engbersen et al., 2019).

The spatial lay-out of Rotterdam is in the first place characterized by the socio-spatial division between the “poor” South part below the New Meuse river and the more affluent part above the river where the city center lies. Adjacent to the city center there are several traditional working-class neighborhoods with a relatively large pre-war housing stock. These central neighborhoods have undergone gentrification in the past decades (Hochstenbach & Van Gent, 2015). The outer neighborhoods of the city are generally residential areas that constitute a mix of lower and middle classes. Hochstenbach and Musterd (2019) show that between 2005 and 2015 the share of low-income households decreased in several central neighborhoods and increased in the outer neighborhoods, which signifies a gradual decentralization of low-income households.

Rotterdam is further known as a “unique” or “extreme” case in urban research because during the past 20–30 years it has been a site of political contestation where policies on social exclusion, immigrant integration, safety, “social mix” and gentrification have become highly intertwined (Doucet et al., 2011; Scholten et al., 2019; Uitermark & Duyvendak, 2008; Uitermark et al., 2007; Van Eijk, 2010; Van Gent et al., 2018). This particular policy mix can mainly be traced back to the sudden rise of right-wing populist politics in Rotterdam in 2002, which preceded the establishment of right-wing populism at the national level (see Uitermark & Duyvendak, 2008). Since then the general tendency amongst different coalitions in Rotterdam has been that “problem neighborhoods” with “opportunity-poor” residents need to be transformed into “clean, safe, and whole” – i.e. livable – neighborhoods in which “opportunity-rich” residents contribute to a better living environment. One of these policies is the Rotterdam Act (Van der Laan Bouma-Doff, 2007; Van Gent et al., 2018). This act prohibits unemployed households from moving into certain deprived areas that are mainly located on the south side of the New



Meuse river. The policy theory is that livability in these areas will increase when a further influx of unemployed and poor residents is prevented. Whereas the Rotterdam Act prevents certain groups from moving into designated areas, gentrification and social mixing are also actively promoted by the municipality (Doucet et al., 2011; Uitermark et al., 2007). Thus, the municipality clearly favors the residence of higher socioeconomic groups over that of lower socioeconomic groups.

In sum, the social and socio-spatial structure of Rotterdam have significantly changed over the past two decades. Combining the literature on social classes and spatial divisions with more specific insights about Rotterdam, we expect three changes to have occurred:

1. The share of middle classes increased between 2008 and 2017. Considering the substantial rise in educational level in Rotterdam, it is likely that the share of middle classes with high cultural capital in particular has increased.
2. The increases in forms of precarious employment might also lead to some growth at the bottom of the class structure.
3. Classes with higher economic capital increased in central neighborhoods and classes with lower economic capital increased in outer neighborhoods.

## Data and method

We use two waves from the Rotterdam Neighborhood Profile survey to investigate the class structure and differences in class sizes between 2008 and 2017. This biennial cross-sectional survey, which covers all 71 administrative neighborhoods and is designed to be representative on neighborhood level, is an instrument to monitor the “social and physical state” of the city (see Municipality of Rotterdam, 2019). Respondents were selected according to a stratified random sampling method in which neighborhoods were the grouping level. In addition, ethnic minorities such as Turks and Moroccans were oversampled to obtain a representative sample. The response rates for 2008 and 2017 were 24% and 21% respectively.<sup>3</sup> Our analysis includes the adult population, i.e. people aged 18 and above. After data reduction, the 2008 sample included 10,686 respondents (2.2% missing values were deleted) and the 2017 sample included 15,215 respondents (3.4% missing values were deleted).

Owing to the sample’s skewed distribution with respect to multiple sociodemographic characteristics, weights were developed based on population data obtained from the municipality’s research department. The weights account for sample skews regarding age, gender, household type, education, and ethnicity. The development of the weights is discussed in the Online Appendix. The weights are applied in both the latent class analysis and subsequent descriptive and spatial analyses.

### *Economic capital*

Two measures reflect the economic capital of respondents. First, *household income* measures the self-reported monthly net income of a respondent’s household, excluding any additional benefits such as healthcare, rent, or child and holiday allowances. Five answer categories were recoded to four levels: minimum (up to € 950 for single-adult households, up to € 1,300 for dual-adult households); minimum to modal (between € 950

– € 1,300 for single-adult households, between € 1,300 – € 1,700 for all households); modal to double modal (between € 1,700 – € 2,950); and more than double modal (€ 2,950 or higher). The categories correspond to the 2008 national income distribution from which the levels of minimum and modal income were derived. In the 2017 survey, the price levels were adjusted for inflation. Since many respondents did not provide a valid answer (23.1% in 2008 and 23.3% in 2017), we imputed their scores using regression analysis with an added random residual.<sup>4</sup> The following variables were used to predict household income: education level, hours worked, homeowner (yes/no), employed (yes/no), age, age squared, self-rated health, autochthonous (yes/no), couple with kids (yes/no), and respondents' ability to "make ends meet". The model predicted 57% of the variance in household income. The imputed scores were recoded to correspond to the original answer categories.

Second, to include a measure of wealth we used a data file from the municipality with estimations from the Real Estate Valuation Act. These conservative estimations reflect market values of dwellings and are used to determine the property tax. We were able to link respondents with this file on the pc6-level, the smallest postcode area in the Netherlands. A pc6-area includes about 50 addresses on average. We took the median house price in these pc6-areas. We further distinguish between homeowners and renters, since homeowners at least partially possess the capital reflected in the house price whereas renters do not. The variable *property value* consists of four categories: renter <125k; renter >125k; homeowner <200k; homeowner >200k.

### **Social capital**

We use two measures to assess to what extent people receive social support and have ties with their friends and acquaintances. *Social support* is a variable based on four 5-point Likert items that measure various forms and feelings of support (or the lack thereof). The four items include statements about having someone to talk to about important issues; whether respondents felt abandoned; whether somebody expressed interest in the respondent; and whether respondents had difficulties receiving help from people close to them. Respondents needed three valid scores on this scale (Cronbach's alpha 2008 = .829; Cronbach's alpha 2017 = .834), which was subsequently recoded into three categories: (totally) disagree; neutral; and (totally) agree.

*Contact with friends* is operationalized by asking respondents about their contact frequency with friends or well-known acquaintances. The question emphasized that it was about people from outside the respondents' homes. The answer categories were recoded into at least once a week; at least once a month; or less than once a month. These two measures only partially correspond to Bourdieu's notion of social capital. The theoretical and methodological implications are considered in the discussion section.

### **Cultural capital**

We used two measures that account for distinct forms of cultural capital. First, *education level* is a common measure of cultural capital, reflecting its "institutionalized" state (Bourdieu, 1986).<sup>5</sup> Respondents were asked about their obtained level of education, which was recoded into the following categories: primary or no education (low); junior

secondary vocational up to senior general secondary (middle); and higher professional or university (high).

Second, *cultural visit* measures various forms of mostly highbrow cultural capital. Respondents were asked how often they went to a movie or theater play, a concert, a cultural festival and/or a museum. The original six response categories were recoded into three categories: at least once a month; less than once a month; never. Although this measure covers a variety of practices, most of them include “higher forms” of culture. Going to the movies or visiting a concert are obviously more mainstream forms of cultural participation. Still, 31.1% of the respondents never engage in any of these practices and 34.8% less than once a month. This measure reflects a quite distinct, more “embodied” form of cultural capital (Bourdieu, 1986). It also captures the general divide between those who “participate” and those who don’t, which is marked as the most important axis in cultural capital research (Bennett et al., 2009). Yet, some studies reason that the highbrow distinction has become less relevant, especially among younger cohorts, while other ways of distinction have gained prominence, such as “omnivorousness” or “emerging cultural capital” (see Friedman et al., 2015). A limitation is that our survey does not include measures on these other forms of cultural capital.

Descriptive information about the variables can be found in [Table 1](#).

### **Method and model selection**

Latent class analysis (LCA) is a method to recover latent classes from observed categorical variables. The basic idea is that distributions on these variables differ between unobserved groups (i.e. latent classes) and that these groups explain the association between the manifest variables (Magidson & Vermunt, 2004; Oberski, 2016). LCA builds on the assumption of conditional independence, meaning the manifest variables are assumed to be mutually independent in each latent class. In other words, within a latent class the correlation between variables should be zero. LCA is further probabilistic in nature. Membership of a certain class increases the probability of having a particular set of scores on the manifest variables, but this is not absolutely determined. In turn, the responses provided by respondents on the relevant variables determine their most likely class membership. LCA is an interesting method for social class analysis, because it can identify similar individuals who might possess much of a certain capital type but little of another (Waitkus & Groh-Samberg, 2019; cf. Hagenars & Halman, 1989). This identification is especially useful in disentangling the middle classes, which are usually characterized by robust levels of economic capital but heterogeneous in terms of social and cultural capital (Savage et al., 2015a).

The LCA was performed in Stata 16.0 using a plug-in developed by Lanza et al. (2018). The parameters are estimated by maximum likelihood using the expectation-maximization (EM) algorithm. The iterative nature of the EM-algorithm makes it possible to estimate models with missing values on the manifest variables (10.4% of total sample). The missing values are replaced by estimated values, which are subsequently used to estimate the parameters. Further, the model can fit categorical variables. In order to reach a global instead of local maximum, the models were estimated 25 times with different starting values. The LCA was performed on the pooled dataset, combining the cross-

**Table 1.** Descriptive information on variables in the LCA (weighted proportions).

Variable	2008	2017	Total
<i>Household income</i>			
% minimum or less	21.2	24.2	23.0
% minimum to modal	33.0	32.0	32.4
% modal to double modal	27.3	25.0	25.9
% more than double modal	18.5	18.8	18.7
<i>Property value</i>			
% renter <125k	30.1	32.9	31.7
% renter >125k	29.4	22.9	25.7
% homeowner <200k	23.8	30.5	27.7
% homeowner >200k	16.7	13.7	15.0
<i>Social support</i>			
% (totally) disagree	6.8	9.9	8.6
% neutral	20.5	24.0	22.5
% (totally) agree	72.8	66.2	68.9
<i>Contact with friends</i>			
% less than once a month	5.4	8.2	7.1
% at least once a month	16.5	17.0	16.8
% at least once a week	78.1	74.7	76.1
<i>Education level</i>			
% low	43.0	34.0	37.4
% middle	36.0	39.0	37.7
% high	21.0	27.0	24.8
<i>Cultural visit</i>			
% never	42.0	23.8	31.3
% less than once a month	31.1	37.4	34.8
% at least once a month	26.9	38.8	33.9
<i>N</i>	10,686	15,215	25,901

**Table 2.** Fit measures of different LCA models (pooled dataset).

Model	Resid. df	Entropy R2	Adjusted BIC	BIC	AIC	Log-likelihood (pseudo)
4 classes	1,236	0.603	3,341.9	3,529.4	3,047.9	-152,406.3
5 classes	1,221	0.610	2,989.6	3,224.8	2,620.8	-152,177.8
6 classes	1,206	0.581	2,678.8	2,961.7	2,235.3	-151,970.0
7 classes	1,191	0.584	2,566.9	2,897.4	2,048.5	-151,861.6
8 classes	1,176	0.565	2,554.4	2,932.5	1,961.3	-151,803.0
9 classes	1,161	0.569	2,541.1	2,967.0	1,873.3	-151,744.0
10 classes	1,146	0.563	2,553.2	3,026.7	1,810.5	-151,697.6

log-likelihood is a pseudo-function because weights were used  
*N* = 25,901

sectional surveys of 2008 and 2017. Respondents are assigned to their most likely class based on the highest posterior probability (Goodman, 2007).

As LCA is an exploratory method, choosing the best LCA model depends on several substantive and methodological choices. Different fit measures guide the decision on picking the best model, but there is no standard approach in this regard (Magidson & Vermunt, 2004; Nylund et al., 2007; Oberski, 2016; Tein et al., 2013). The Stata plug-in provides different information criteria (AIC, BIC, and adjusted BIC) and a classification criterion (entropy R2) that serve as indications of model fit. Table 2 shows these fit measures with a different number of classes. LCA literature indicates that choosing the model with the lowest BIC is the most widely used procedure (Oberski, 2016; Tein et al., 2013), although with some categorical LCA models the adjusted BIC might be more appropriate (Nylund et al., 2007).<sup>6</sup> Table 2 indicates that a model with seven classes has the lowest BIC, whereas a model with nine classes has the lowest adjusted BIC. The

entropy R2, a measure of uncertainty classification (see Tein et al., 2013), is slightly higher for the seven-class model compared to the nine-class model. Based on the relevant statistical criteria, a seven-class or nine-class model might thus be preferred. Another relevant criterion, however, is substantive interpretation, i.e. which model makes sense from a theoretical perspective (Oberski, 2016). In our interpretation, the model with nine classes does not provide any additional insights with respect to the theoretical plausibility of the class structure while the seven-class model offers a more elegant and parsimonious solution. Hence, we present findings from the model with seven classes, also because these classes resonate with earlier studies on social class that examined different class fractions.

**Table 3.** Descriptive statistics for seven classes.

Variables	Established upper class	Cultural middle class	Traditional middle class	Contact-poor middle class	Emergent middle class	Lower class	Precariat	Total
Household income (1–4)	3.9	3.1	2.9	2.9	1.6	1.7	1.4	2.4
Property value (in euros)	308,599	146,233	179,266	163,684	126,704	124,802	116,691	160,907
% homeowner	86	57	86	61	13	4	13	43
Friends contact (1–3)	2.8	3.0	2.9	1.7	2.9	2.7	2.2	2.7
Social support (1–3)	2.9	2.9	2.8	2.2	2.6	2.9	1.6	2.6
Education level (1–7) <sup>1</sup>	6.1	5.6	3.5	4.2	4.3	2.4	2.5	4.0
Cultural visit (1–3)	2.5	2.8	1.9	1.8	2.7	1.3	1.3	2.1

all values indicate mean scores (except % homeowner). Range of variables is shown between brackets.

<sup>1</sup>The original variable is used here to better indicate the variation across classes.

N = 25,901

**Table 4.** Sociodemographic characteristics for seven classes.

Variables	Established upper class	Cultural middle class	Traditional middle class	Contact-poor middle class	Emergent middle class	Lower class	Precariat	Total
Mean age	46	40	48	51	41	54	52	47
Median age	43	37	47	51	37	57	53	45
% female	44	48	50	40	55	57	54	51
% employed	84	82	64	62	49	30	23	56
% unemployed/ welfare benefits	1	3	4	6	14	16	32	11
% retired	10	7	17	22	13	33	26	18
% dual-adult HH	87	59	75	71	39	53	45	59
% 1-adult/1-parent HH	13	41	25	29	61	47	55	41
% migration background <sup>1</sup>	28	41	36	39	57	52	61	46

<sup>1</sup>Persons who are born abroad or have at least one parent born abroad.

N = 25,901

**Table 5.** Class change between 2008 and 2017.

	2008		2017		
	Population (estimated)	%	Population (estimated)	%	% total
Established upper class	52,975	11.8	58,061	11.8	11.8
Cultural middle class	57,396	12.8	86,146	17.5	15.6
Traditional middle class	91,126	20.3	78,483	16.0	17.7
Contact-poor middle class	21,560	4.8	27,572	5.6	5.3
Emergent middle class	70,787	15.7	107,562	21.9	19.3
Lower class	103,044	22.9	65,403	13.3	17.2
Precariat	53,101	11.8	68,609	13.9	13.1
Total	449,989	100	491,835	100	100
<i>N (survey)</i>		10,686		15,215	25,901

Population numbers are based on percentage share in the sample and total population aged 18 + . The class shares are statistically different from each other in 2008 and 2017 ( $p < .05$ , two-sided tests; pairwise comparisons within a row are adjusted using the Bonferroni correction), except for the established upper class.

In addition, we performed several analyses to test the validity and robustness of our seven-class solution.<sup>7</sup> These robustness checks included separate analyses on the 2008 and 2017 samples, analyses that examined potential biases in the results due to the missing values on the income variable and analyses that considered the influence of the sample size. Overall, our seven-class solution seems robust. An elaboration of these robustness checks can be found in the Online Appendix.

## Results

### *A class typology*

Table 3 indicates how each class scores on the variables used in the LCA. Thus, for each class this table presents the volume and composition of capital that they possess on average. In addition, Table 4 shows the sociodemographic profile of each class and Table 5 includes the weighted proportions of all classes in the sample. We use these tables to describe the seven classes. We labeled the classes according to the characteristics that best typify each class.

The class with the highest volume of capital is the *established upper class* (11.8% of the sample). Almost all respondents in this class have a double modal household income or more and the property value of their dwellings is almost twice the city's average. The established upper class also has very high levels of social and cultural capital. For instance, the average education level is a professional degree. Most respondents in this class work fulltime (84% employed in total), live in a household with two adults (87%) and are autochthonous (72%). The established upper class clearly has an "elite"-like status, especially due to its high level of economic capital, which sets it apart from the middle classes (cf. Piketty, 2014; Savage et al., 2015a).<sup>8</sup>

The *cultural middle class* (15.6%) is a relatively young class and has a high household income on average, but its property value is lower than the city's average (57% owns a house). Although its educational level is slightly lower, the cultural middle class has levels of social and cultural capital that are similar to the established upper class. Next to its young age (mean: 40), this class includes many employed respondents (82%) and relatively many one-adult households (41%) in comparison to the other middle classes with high economic capital. Taking things together, this class seems to mainly represent

the more prosperous urban professionals who likely comprise a mix of occupational groupings – technical, public, and service sector – and household compositions (cf. Boterman & Musterd, 2017; Butler & Robson, 2001).

The *traditional middle class* (17.7%) has a household income and property value above the city's average, and 86% is homeowner. Its level of social capital is also above average, but its cultural capital is lower compared to the other middle classes. The average level of education is senior vocational and cultural visits are made less than once a month. In general, this class is in their late-forties and most members are either employed (64%) or retired (17%) and a majority of households include two adults (75%). Hence, people in this class are likely to be older workers with intermediate occupations. Some studies argue their position is increasingly vulnerable (see Engbersen et al., 2018; Goos et al., 2014), though their level of economic capital is rather high here.

The next middle class is the *contact-poor middle class* (5.3%). This class has a modal to double modal income on average and the majority owns a house (61%). As the name indicates, the contact-poor middle class is mainly characterized by its relatively low level of social capital. The level of social support is below average and the score on contact frequency indicates they only speak to friends and acquaintances a few times a month. Their level of education is slightly above average, but their cultural visit is just below average. Furthermore, this class reveals the gendered nature of class differences as 60% is male. In addition, most respondents are employed (62%) and live in a dual-adult household (71%). The contact-poor middle class shows that even middle classes who possess considerable economic capital can still lack a substantial amount of social capital. Due to its low level of social capital, this class resembles the technical middle class identified by Savage et al. (2013).

An interesting class that results from the LCA is the *emergent middle class* (19.3%). This young class is low on economic capital, but fairly high on social and cultural capital. It has a high contact frequency with friends and acquaintances and the level of social support is more or less average. In addition, it goes on a cultural visit multiple times per month and its education level is around senior general secondary. A large proportion of this class is around their thirties (median: 37) and many members are employed (49%) or a student (17%, not reported in Table 4). Furthermore, one-adult households are over-represented (61%) as are respondents with a migration background (57%). These indicators suggest that we are dealing with a class in which many people are likely to be socially mobile later on in their life course, especially considering their combination of capital types. We therefore labeled this class both “middle” and “emergent”, even though in economic terms it is hardly a middle class. The emergent middle class is comparable to the “emergent service worker” in Savage et al. (2013).

The *lower class* (17.2%) is clearly defined by its low level of economic capital. Its household income is close to the minimum and only four percent owns a house. Yet, its social capital is high. The level of social support is high and the contact frequency with friends and acquaintances is almost on a weekly basis. The lower class possesses little cultural capital; its education level is around junior vocational. Again, the gendered nature of class is visible here, since 57% of this class is female. It is also older on average (54) and includes many retirees (33%), one-adult households (47%) and respondents with a migration background (52%). What is interesting about this class is that despite their low levels of economic and cultural capital, they still have considerable social capital

to rely on. Similar profiles of this class can be found in studies on cohesive working-class (migrant) communities (e.g. Gans, 1982; Young & Willmott, 1986).

The final class is the *precariat* (13.1%). This class resembles the lower class in its low levels of economic and cultural capital, but has very little social capital as well. In general, it receives limited social support and the contact frequency with friends and acquaintances is around once a month or less. The precariat has a similar demographic profile as the lower class, though the share of unemployed is higher (32%). This class can thus be considered the most vulnerable class, since it has a very low volume of capital (cf. Standing, 2011; Wacquant & Wilson, 1989).

### ***Changes in class structure and geography***

One of the central questions in this paper is how this class structure changed between 2008 and 2017. Table 5 shows some substantial differences in class shares between 2008 and 2017. The cultural middle class and emergent middle class both increased in size by 4.7% and 6.2% respectively. On the other hand, the traditional middle class and the lower class both clearly diminished; the former by 4.3% and the latter by 9.6%. The shares of the other classes remained more or less stable, although the precariat grew by 2.1%.

These results demonstrate that class change is not simply a process whereby the middle class grows at the expense of the working class (professionalization) or whereby the middle class slowly disappears (polarization), since specific changes take place within the class structure. The main finding from our model is that two large classes with relatively little cultural capital, the traditional middle class and lower class, were smaller in 2017 than in 2008 while two other classes with a high level of cultural capital, i.e. the cultural middle class and emergent middle class, grew during this period. Looking at economic and social capital, the cultural middle class resembles the traditional middle class – the wealth of the latter is somewhat higher – and the same applies to the emergent middle class and lower class. Hence, what our model principally shows is that cultural capital is the main factor underlying class differences in Rotterdam between 2008 and 2017. In a way the class structure became more “middle class” because the lower class in particular decreased in size. Therefore, professionalization seems the dominant process, but at the same time our model shows that class differences over time are more complex than can be captured by the concepts of professionalization and polarization (see also discussion). These findings are in line with our expectation that the middle classes with high cultural capital increased the most in Rotterdam. The expectation that there would also be growth at the bottom of the class structure does find some support here when we only consider the precariat.

Another central question is how this class structure relates to spatial divisions. That is, are spatial patterns distinct for every class and how have these changed during the economic recession? We focus on spatial differences in class concentrations rather than on segregation. Our main goal here is to examine class differences between 2008 and 2017 from a spatial perspective. We selected three classes to illustrate that most classes exhibit a distinct spatial pattern. These include the established upper class, the traditional middle class and the emergent middle class. We demonstrate how these classes were dispersed across the city in 2008 and how this dispersion differed between 2008 and 2017.<sup>9</sup>





**Figure 1a.** (a) Established upper class in Rotterdam, 2008.

**Figure 1(a)** shows that in 2008 the established upper class was strongly concentrated in a few neighborhoods in the east and northern part of the city. Since some of these neighborhoods are known as “traditional” elite neighborhoods, it is no surprise that we find strong concentrations here of the established upper class. **Figure 1(b)** reveals that between 2008 and 2017 the share of established upper class mainly increased in the city center and on the south banks of the New Meuse river. This shift is likely a result of how these areas have been transformed in the past decade. Multiple residential skyscrapers were built here in the past decade, aimed at attracting affluent groups like the established upper class (cf. Doucet et al., 2011).

The traditional middle class predominantly lives in the outer neighborhoods of Rotterdam, which are mostly residential areas (**Figure 2(a)**). Their relatively low level of cultural capital might explain this pattern, since most provisions preferred by people with high cultural capital (e.g. museums and theaters) are located in and around the city center. The traditional middle class might on the other hand prefer the space and residential atmosphere that is associated with the outer neighborhoods of Rotterdam (cf. Boterman et al., 2018; Custers & Engbersen, 2020). Their concentration in the south-west part of the city might follow from the proximity to the harbor. The harbor provides many well-paid jobs for the low and middle educated because of the labor intensiveness of these jobs. The traditional middle class fits this profile quite well. **Figure 2(b)** confirms that the traditional middle class has decreased overall, since we observe a negative difference in many neighborhoods. The decline in the south-west is particularly substantial, indicating that this area has changed quite rapidly (cf. Uitermark et al., 2007).

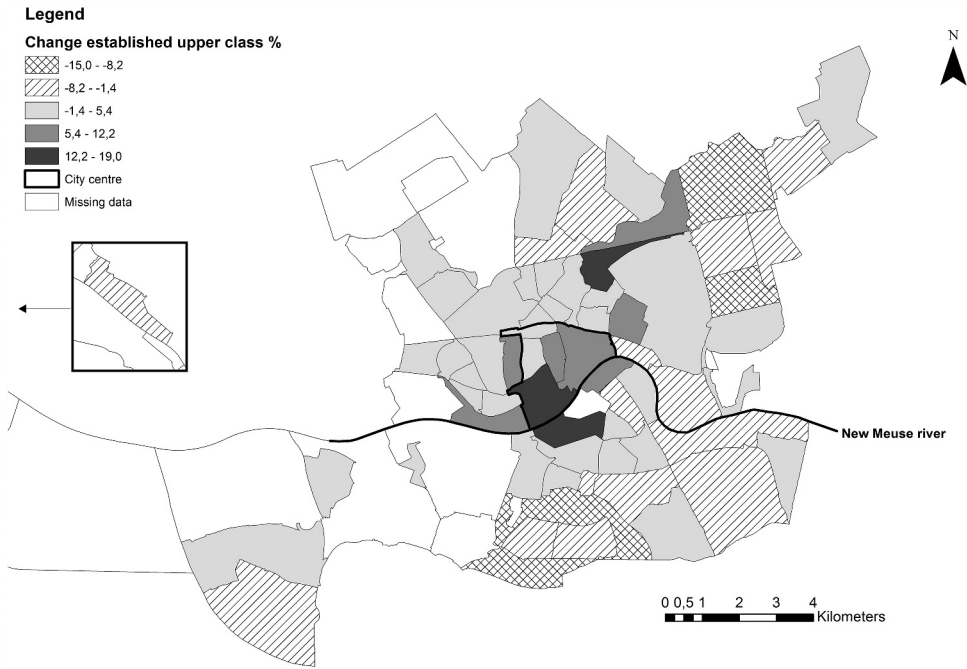


Figure 1b. Change in the established upper class in Rotterdam, 2008-2017



Figure 2a. (a) Traditional middle class in Rotterdam, 2008.

The emergent middle class predominantly lives in the city center and the adjacent neighborhoods in the west, north, and east (Figure 3(a)). As with the traditional middle



**Figure 2b.** (b) Change in the traditional middle class in Rotterdam, 2008–2017.

class, their location might also be explained in terms of cultural capital. These areas are popular among adolescents since they are located close to cultural provisions and other amenities. However, [Figure 3\(b\)](#) shows that the emergent middle class has become more spread across the city. One possible explanation is that housing is generally more accessible in other parts of the city (cf. [Hochstenbach & Musterd, 2019](#)). The changing spatial patterns of the established upper class and emergent middle class partly confirm our expectation that classes with higher economic capital have become more dominant in the city center. This spatial difference between 2008 and 2017 is, however, equivocal to some extent.

## Conclusion and discussion

This study set out to scrutinize three issues:

1. The class structure of Rotterdam when social class is conceptualized as the possession of economic, social, and cultural capital,
2. Changes in this class structure between 2008 and 2017, and
3. The spatial manifestations of this class structure and changes in spatial divisions in this period.

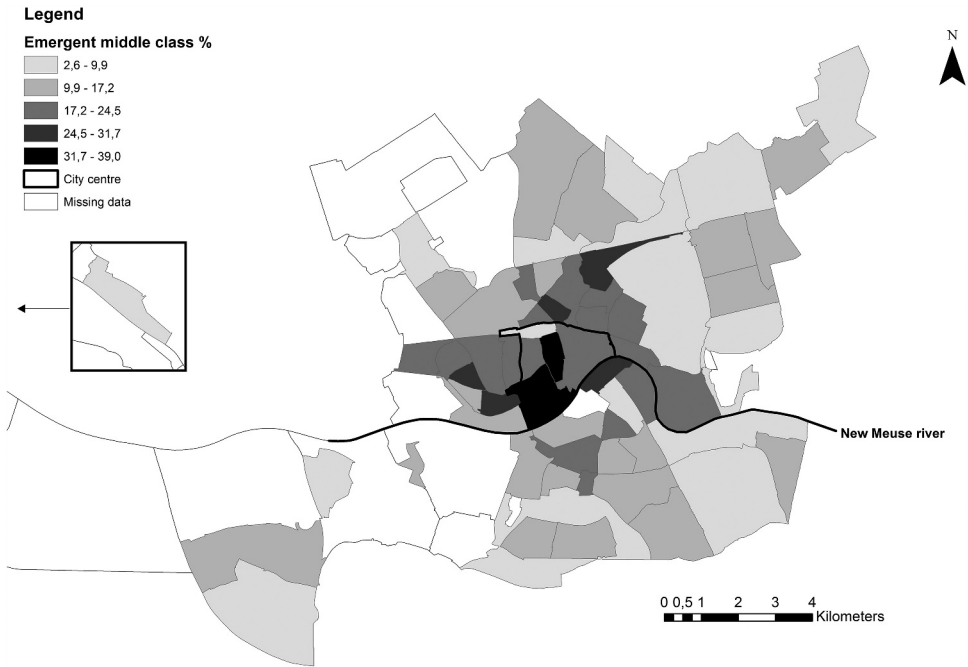


Figure 3a. (a) Emergent middle class in Rotterdam, 2008.



Figure 3b. (b) Change in the emergent middle class in Rotterdam, 2008–2017.

In addition, our goal was to link these issues to wider theoretical debates on the changing urban structure.

We established an elaborate class structure with one upper class, four middle classes, and two lower classes (cf. Savage et al., 2013; Waitkus & Groh-Samberg, 2019). Our class typology demonstrates the heterogeneous and fragmented nature of the class structure, in particular within the middle segment. In addition, we found that between 2008 and 2017 multiple changes took place within the class structure. The overall change is that the lower class and traditional middle class were partially replaced by the emergent middle class and cultural middle class. When we interpret these changes in the class structure in terms of polarization and professionalization, we assert that professionalization seems to be the dominant process.

However, this shift is understood in terms of cultural capital, because the middle classes with high cultural capital increased at the expense of the lower and middle classes with low cultural capital. This assertion illustrates that with our multidimensional class structure the concepts of polarization and professionalization become somewhat ambiguous since no clear class hierarchy exists. For instance, the traditional middle class has a better economic position than the emergent middle class, but the latter possesses more cultural capital. The way in which one class is more advantaged than the other depends on context, i.e. in which “field” a certain capital offers advantage (Bourdieu, 1984). When one class is gradually replaced by another, one should therefore scrutinize what kind of professionalization or polarization this shift implies, not in the least because polarization and professionalization usually refer to change in one social dimension. A continued emphasis on precision is thus important in studying changes in urban structure (Hamnett, 2001; Nørgaard, 2003; Pratschke & Morlicchio, 2012).

Our spatial analysis further reveals that several classes are dispersed in specific ways and that spatial divisions changed between 2008 and 2017. We observe that the established upper class became more concentrated in and adjacent to the city center, that the traditional middle class decreased in most neighborhoods, and that the emergent middle class mainly increased in neighborhoods outside the city center. In general, we find that middle classes with more cultural capital tend to live closer to the city center (e.g. Boterman et al., 2018; Cunningham & Savage, 2017; Hanquinet et al., 2012).

We offer two explanations for these findings on the class structure and spatial divisions and discuss their social and political implications as well. One explanation is that we see the effects of Rotterdam policies aimed at attracting the middle and upper classes to the city. These policies are mainly related to housing, such as reducing the social housing stock (Hochstenbach & Musterd, 2018) and excluding unemployed households from certain areas (Van Gent et al., 2018). The decline of the lower class can be understood through some of these policies, since this class predominantly lives in rental dwellings. On the other hand, the move of the established upper class to the city center might be due to the transformation of the waterfront areas on the North and South side of the New Meuse river. In the past two decades these locations have evolved as residential areas including residential towers containing high-end apartments (cf. Doucet et al., 2011).<sup>10</sup> This development might reduce the emergent middle class’s access to the inner city, as it has become too expensive to live here. Thus, the relations between classes are made manifest through these spatial changes as one class move is associated with another.

The findings implicate that issues of accessibility and affordability have become more pertinent since less living space remains for classes with low economic capital. Not only can rising housing prices push lower classes to the periphery or restrict access to the city (Hochstenbach & Musterd, 2018), they can also exacerbate existing inequalities within Rotterdam (Hochstenbach & Van Gent, 2015). The “poor” South part has relatively few houses that match the esthetic preferences of the established upper class and cultural middle class (cf. Bridge, 2006; Ley, 2003) and in addition, the stigma of “poverty” further lowers its attractiveness to the middle classes. Housing market pressure in the city center and adjacent neighborhoods is therefore likely to further increase, as space that is appealing to these classes, who are expected to become more dominant in the city, is limited (cf. Bacqué et al., 2015). Eventually this process could lead to a situation where some of these neighborhoods develop into segregated higher-class areas, although such places are rare in the Netherlands (Boterman et al., 2020).

A second explanation relates to broader labor market trends. In Rotterdam both the number of flexible jobs (temporal employment and self-employment) and the education level have increased in the past decade. These trends might explain the rise of the emergent middle class, a class with relatively high cultural capital but rather low economic capital due to their flexible jobs. Unfortunately, our data do not include detailed information about occupational status and employment contract to further examine the association between labor market change and our results. This issue indicates a general limitation of our study. We have little insight into the mechanisms that drive changes in the urban class structure and spatial divisions (Hochstenbach & Van Gent, 2015). We could not investigate to what extent social mobility, migration, gentrification, aging, the economic recession or other possible mechanisms played a role.

We conclude with some theoretical and methodological reflections. First, our approach in this paper deviates from Bourdieu’s heuristic scheme of the social space, since next to economic and cultural capital we included social capital in our analysis (cf. Savage et al., 2013). Including social capital does, however, not contradict Bourdieu’s account of social class, as Bourdieu argued that classes are positions in the social space that is constructed by the distribution of different forms of capital (Bourdieu, 1987). When a capital form is a source of differentiation that can provide advantage in a certain field, it can be considered part of the social space. Social capital contains this property, because it enables its holder to derive resources from a network.<sup>11</sup>

That being said, our measures in this study only partly cover this notion of social capital. They do not measure the diversity of contacts or the status of connections in a network. Nor did we have a measure of whether people could mobilize their network to gain specific resources (Lin, 1999). Yet, by including contact with friends and acquaintances we tap into connections that may represent both strong and weak ties (Granovetter, 1973) and moreover, our social support measure indicates the resources people may obtain through receiving help and being connected to others. Although this operationalization might be closer to Putnam’s communal understanding of social capital (Putnam, 2000), our analysis detects important differences between social classes. For instance, the possibilities for the lower class to obtain informal help are more various than those of the precariat. The decline of the lower class may further indicate that gentrification contributes to breaking up cohesive communities, which reduces the social capital of lower-class residents (Gans, 1982; Young & Willmott, 1986). These differences

and processes would not have been observed if social capital had been omitted from the analysis. Still, we acknowledge that our analysis is limited in its ability to differentiate between classes regarding power in social relations.

Finally, we reflect on our method. In LCA each respondent is assigned to a certain class based on probability (Goodman, 2007). For classes that are relatively similar these probabilities might be quite close. This implies that belonging to a certain class can be arbitrary to some extent, because a minor variation in a respondent's response on the variables might lead to a different classification. In addition, depending on the how the variables are coded and which samples are used, the outcomes of LCA might differ (cf. Mills, 2014). We applied weights to correct for sample skews and ran the analyses with different variable codings. Our main conclusions did not change when we performed a number of different analyses (see method section). It signifies, however, that our typology should be viewed as one of many perspectives on the urban class structure. We emphasize that our classes are "ideal types", meaning that while they represent the typical features of a certain class, not every individual within that class needs to have exactly the same features (Hagenaars & Halman, 1989). In the end, a typology should be judged according to its analytical strength to provide (new) insights into the social structure of the city and its spatial divisions.

## Notes

1. Symbolic capital, a fourth type in Bourdieu's work, is not discussed here.
2. Income and occupation are mostly used as socioeconomic indicators in these studies.
3. The target population consisted of people aged 15 years and older living in the Rotterdam municipality. The municipality's population register was used as sampling framework (addresses), complemented with commercial data on telephone numbers. Questionnaires were available in Dutch, English, Arabic, and Turkish. In 2008, most questionnaires were conducted online (39%) or by phone (39%); in 2017, this was mainly online (59%) or by phone (26%).
4. This single imputation was performed in SPSS by the authors. Unfortunately, the preferable strategy of multiple imputation could not be combined with our latent class analysis. The results did, however, not substantially change when the analysis was repeated with different single imputations.
5. Even though education is primarily a measure of the "institutionalized" state of cultural capital, acting as a "certificate of cultural competence" in society (Bourdieu, 1986), it also measures the potential to accumulate economic capital since education indicates a person's level of skills and training – their human capital (Becker, 1964). Education is thus a somewhat ambiguous variable in social class analysis (see Houtman, 2001).
6. The BIC is calculated as  $-2LL + m * \ln(n)$ , where  $-2LL$  is  $-2$  times the log-likelihood of the model,  $m$  is the number of estimated parameters, and  $n$  is the number of observations.
7. We thank Reviewer 3 for the suggestions on this part.
8. We did not use the label "elite" here to describe this class, because we think this label should be reserved for an even smaller and more privileged segment of society (cf. Savage et al., 2015b).
9. The categories are specified according to equal intervals, enabling comparison between different maps. Areas that have missing data are either nonresidential neighborhoods, newly built neighborhoods or neighborhoods that were not part of Rotterdam in 2008.
10. This process bears some resemblance to "super-gentrification" (see Butler & Lees, 2006), but differs in at least two ways. First, the established upper class possesses less capital than the

elite “super-gentrifiers” from New York or London and second, the Rotterdam waterfronts areas were not middle-class enclaves but rather business districts or social housing areas.

11. Without being very explicit on this issue, Bourdieu (1987) states that social capital is secondary to economic and cultural capital concerning class positions.

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No potential conflict of interest was reported by the authors.

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