

OUTDATED? THE PHASE MODEL OF THE DOUBLE INVASION-SUCCESSION CYCLE IN GERMAN-LANGUAGE GENTRIFICATION RESEARCH

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With 4 figures

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Summary: Phase models of gentrification play a prominent role in German-language urban geography textbooks and in shaping discussions on urban gentrification. Their empiric validity however, remains a topic for debate. To contribute to this debate, we conduct a comprehensive literature review of English- and German-language gentrification research over the past 40 years, with a specific focus on phase models. We examined 4,262 papers on gentrification, employing keyword searches and forward citation to pinpoint those that reference the phase models. Out of these, 223 papers mentioned the phase models or relevant key terms, but upon closer examination, only 56 directly addressed the model, forming the basis for our qualitative content analysis. We then assess the evolution of scientific discourse on phase models and their empirical validation. Despite their widespread reference, our study reveals that only a small fraction of gentrification research explicitly engages with these models, with limited empirical evidence to support their comprehensive validity. We argue that, although these models offer a framework for understanding gentrification, they are not universally applicable and neglect important elements such as, amongst others, supply-side factors and the diversity of gentrification trajectories. We advocate for a more nuanced approach to gentrification studies, calling for empirical research that encompasses a wider array of socio-ecological factors and recognizes the heterogeneity of gentrification patterns. Furthermore, there is a need for improved integration of urban research findings into educational materials, proposing a more critical presentation of gentrification models in school textbooks to reflect their limitations and the complex realities of urban development.

Keywords: Gentrification, phase models, empiric validation, urban geography textbooks, knowledge transfer

1 Introduction: Gentrification as a persistent phenomenon in large cities

Inspired by debates in the US and the UK (GLASS 1964, CLAY 1979, DEGIOVANNI 1983, BERRY 1985, KERSTEIN 1990), extensive research on gentrification was conducted in Germany during the 1990s (DANGSCHAT 1991, ALISCH & DANGSCHAT 1996, FRIEDRICHS 1996, HARTH et al. 1998). Initially, gentrification in Germany was a phenomenon largely confined to a few districts within rapidly developing metropolitan areas. However, with the growing trend towards inner-city living and the steep rise in rents, particularly in large cities, the issue has experienced an almost permanent boom in many German cities in recent years.

The use of the term gentrification in urban policy discourse and research has become rather imprecise, despite numerous attempts to define it over the years. It is not uncommon for any form of upgrading of areas, regardless of type of use and spatial location, to be referred to as gentrification. However, the term was originally used primarily to describe the process of population exchange from lower to higher social status groups (GLASS 1964). As this pro-

cess often involves the displacement of individuals, particularly those from lower income groups, or at least their structural exclusion from affected areas, the term gentrification often carries a politically and emotionally charged connotation.

The question of whether displacement is a necessary component of the term gentrification, as formulated by MARCUSE (1986), or whether all processes of social and real estate economic upgrading of areas can be described as gentrification regardless of the precise evidence of individual displacement (FRIEDRICHS 1996), still marks different trends in gentrification research today. Above all, however, the concept of gentrification has broadened considerably in recent decades. First, this applies to the content of gentrification: gentrification is understood not only as the social, but also as the functional gentrification of areas, and symbolic gentrification has been added as a separate dimension (KRAJEWSKI 2006). Second, the spatial reference of gentrification has also broadened. While it was originally concerned with residential areas close to the city centre, where existing 18th and 19th century buildings were upgraded and preserved, gentrification has long been understood to include the redevelopment of brownfield sites

under the term new-build gentrification (DAVIDSON 2018). Phenomena such as holiday homes (COCOLA GANT 2022) or digitally mediated temporary residences (ARDURA URQUIAGA et al. 2022) are now also included under the aspect of gentrification, as they can also have an impact on the resident structure and property development in the neighbourhoods.

Furthermore, gentrification is now being discussed for suburban areas (KAMINER & MOORE 2023) and even rural areas under the term rural gentrification (PHILLIPS & SMITH 2021). Due to the fact that gentrification research can now be considered more globalized (LEES 2022) - sometimes in line with the accusation of a postcolonial narrow view (MALOUTAS 2012) - the term has become even broader and seems to be used for all possible processes of change in all kinds of areas that can be considered critical from a social point of view, such as slums in South American cities (ASCENSÃO 2018).

There is no coherent, consistent, and empirically based theory of gentrification. Nevertheless, there are partial approaches to characterizing the key factors, with research distinguishing between supply-side (housing market, financial markets) and demand-side (population groups and their lifestyles) factors in exploring the causes of gentrification. In the context of demand-side gentrification, phase models play a prominent role. Put simply, these models outline the process of population exchange in a neighbourhood. Initially, two basic models were formulated for this purpose: the four-phase model by CLAY (1979) and the three-phase model by BERRY (1985). In the German context, CLAY'S model has been particularly influential and has led to significant model evolutions such as the double invasion-succession cycle by DANGSCHAT (1988) and the four-phase model by FRIEDRICH (1996). These phase models of gentrification are essential in German-language urban geography textbooks and in shaping discussions on urban gentrification. However, their empiric validity remains controversial. The aim of this paper is to contribute to this debate by systematically reviewing English- and German-language gentrification research in order to assess the development of the scientific discourse on phase models and their empirical validation.

To achieve this, we first show that phase models of gentrification are now widely used beyond the research community in Germany, and illustrate their relevance in school education as well as in media representations. The central chapter 3 provides a comprehensive literature review of English- and German-language gentrification research over the

past 40 years, with a particular focus on phase models. We examine 4,262 papers on gentrification, using keyword searches and forward citations to identify those that refer to the phase models. As noted above, the focus of this analysis is to assess the evolution of the scientific discourse on phase models and their empirical validation. Finally, the article discusses key criticisms of the phase models and suggests directions for future gentrification research.

2 The phase model of gentrification as a fixed element of school education and in media representations

An important observation is that the phase model of gentrification is addressed in varying levels of detail in most German-language urban geography textbooks. Similar to the product life cycle model or the Kondratieff wave model it is one of the human geography models that focuses on both the temporal and the spatial dimension. Within the field of urban geography, it stands out as one of the few phase models. In particular, gentrification is an important topic in the urban geography curriculum of most school textbooks, and the phase model often plays a central role in discussions of this topic. It often serves as the basis for related exercises.

The descriptions of the phase model of gentrification in the textbooks are primarily based on the double invasion-succession cycle proposed by DANGSCHAT (1988), so our research focuses on this model. It is an evolution of CLAY'S (1979) model and is notable in that it not only distinguishes between gentrifiers and long-established residents, but also introduces a third group: the 'pioneers'. These individuals are typically described as younger people with lower incomes, including students and artists with the corresponding lifestyles.

The double invasion-succession cycle is characterised by the initial influence of the pioneers in the gentrification process. They are followed by gentrifiers who ultimately displace the pioneers from the areas. Textbooks illustrate this model with both four-phase (e.g., KLETT TERRA 2020) and five-phase (e.g., SEYDLITZ 2016) variants (see Fig. 1).

The particular dynamic of the double invasion-succession cycle lies in the changing importance of one of the four population groups represented, namely the pioneers. They gain importance in the first two phases but then lose it. The gentrifiers, on the other hand, become more prominent in the second and third phases until they finally achieve domi-

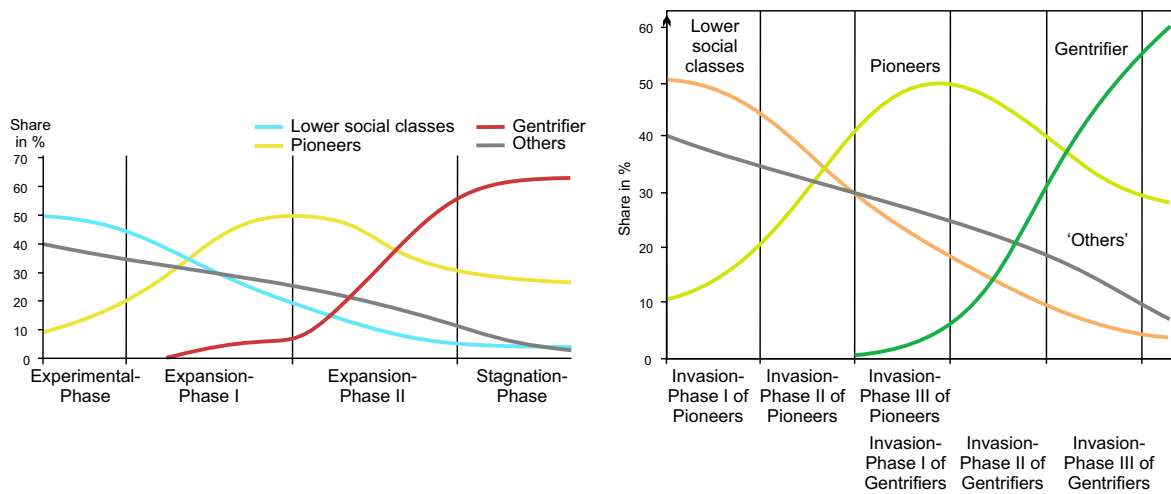


Fig. 1: Examples of the phase model of gentrification illustration in German-language textbooks. The four-phase model, left (KLETT TERRA 2020, original source: ZEHNER 2001) and the five-phase model, right (SEYDLITZ 2016, original source: DANGSCHAT 1988).

nance in the areas; the area is then ‘gentrified’. The other two population groups, the lower social classes and the others, steadily lose importance until they are almost completely absent from the area. In this model, the gentrifiers emerge as the winners. The ‘tragic’ population group in the model, however, are the pioneers: they initiate the dynamic development of the area, but later fall victim to it as they are unable to afford the escalating rents. This tragic narrative is arguably the most striking aspect of the double invasion cycle model.

While there are minor differences concerning the presentation of the models, such as in the naming of the phases, some of which represent creative contributions by textbook authors, a notable feature of the graphical representations is the precision, particularly in the explicit scaling of the y-axis. The student exercises using the model vary greatly in their differentiation between textbooks. What is striking, however, is that despite the apparent precision of the model, these exercises, unlike, for example, the economic geography phase models, do not focus on quantitative verification. Instead, they aim to make

real-world connections for the students and encourage creative interpretation of the models. Another indication that the gentrification phase model is firmly established in most German-language upper secondary school textbooks is the inclusion of new research findings. For example, some textbooks attempt to integrate recent studies on in-situ gentrification or super-gentrification into an evolved version of the model (e.g., DIERCKE 2019, see Fig. 2). In-situ gentrification, first discussed by FRIEDRICHS (1996), modifies the tragic narrative of the model, as some pioneers themselves become gentrifiers and manage to stay in the area. Super-gentrification, first introduced by LEES (2003) and BUTLER & LEES (2006), on the other hand, intensifies the tragic aspect, as former gentrifiers are displaced by super-gentrifiers, resulting in at least four of the five population groups in the areas ultimately losing out.

A look at media representations shows that, at least in German-speaking countries, the double invasion-succession cycle model proposed by DANGSCHAT (1988), which distinguishes between pioneers and gentrifiers, is often central, although

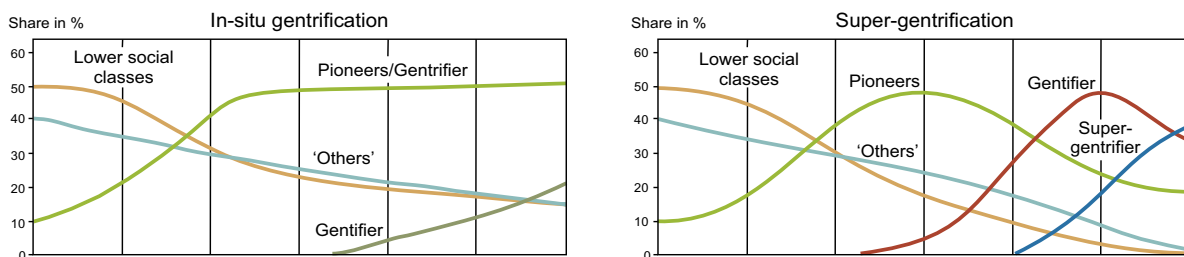


Fig. 2: Further development of the phase model of gentrification in German-language textbooks (DIERCKE 2019, original source: GERHARD & BASTEN 2016)

not universally so (FEDERAL AGENCY FOR CIVIC EDUCATION 2018, FOCUS ONLINE 2022, ZEIT ONLINE 2010). This is also evident from the fact that the first videos that appear on YouTube when searching for ‘gentrification’ clearly refer to this model and its two main groups of actors. In contrast, the group of pioneers does not feature prominently in the English-language media.

As our research combines the fields of geography and didactics, our analysis in this paper is primarily centred on DANGSCHAT’s (1988) double invasion-succession cycle model. This focus is due to the model’s widespread use in German-language textbooks and media, as demonstrated above.

3 Literature review on the development of the phase model

3.1 Methodology

The following is a comprehensive evaluation of international empirical studies from the past 40 years, focusing on issues related to the phase models of gentrification. The review covers a range of sources, including publications, postdoctoral theses, dissertations, and empirical studies from the grey literature. It is limited to works in English and German. The analysis distinguishes between studies on relevant topics in which the models are either

not mentioned at all or only briefly in introductory sections, and those in which the models form a consistent basis for empirical work and are sometimes even systematically tested. The focus is on the latter category of studies.

The research process involved the following steps (see also Fig 3):

A Web of Science search for international publications on gentrification initially identified 4262 articles. This number was narrowed down to 1236 articles using a keyword search of author keywords and abstracts. The keywords were chosen to identify articles potentially investigating phase models in gentrification studies, and included terms such as ‘gentrifiers’, ‘pioneers’, ‘phase model’, ‘invasion’, ‘succession’, ‘cycle’, and their German equivalents.

In addition, the forward citations of DANGSCHAT (1988) and CLAY (1979) were manually downloaded, resulting in 81 publications for DANGSCHAT and 214 for CLAY. Consequently, the total number of publications for the second keyword search was 1452. Of these, 223 publications were identified that either dealt with the model or mentioned keywords related to it. Unlike the first search, this stage involved analysing the full PDFs of the articles rather than just the authors’ keywords and abstracts. After removing duplicates, the final count included 164 journal articles, 5 monographs, and 26 book chapters from 25 edited volumes of peer-reviewed literature, plus 7 reports in non-peer-reviewed literature.

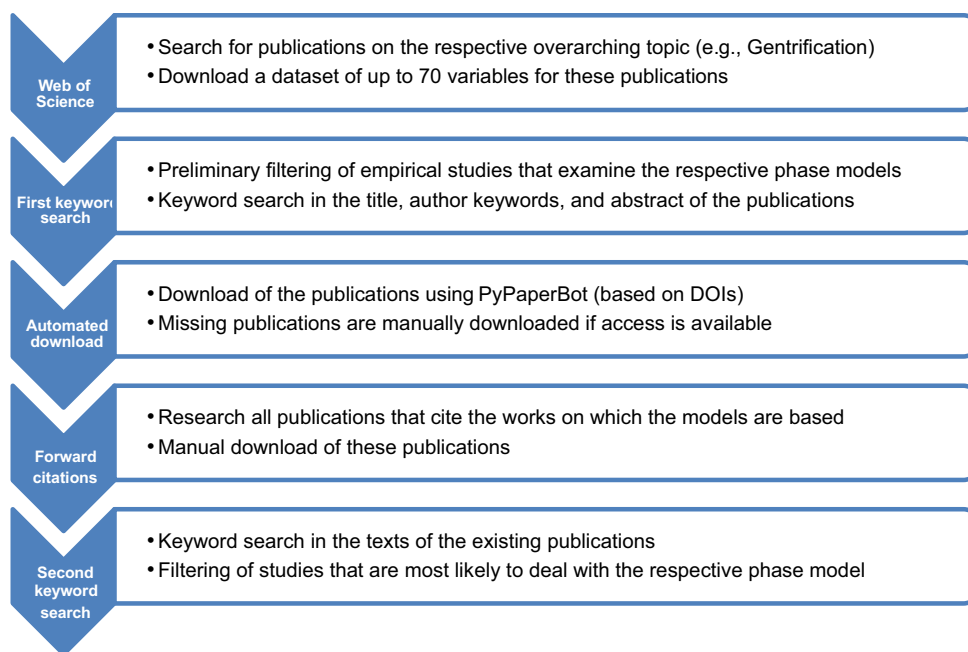


Fig. 3: Scheme for systematic in-depth review of the literature on gentrification phase models

The study by ÜBLACKER (2015) served as a starting point for the identification of relevant German-language qualification papers. Additional theses were found via Google Scholar and the JLU Giessen research portal JUSTfind. In addition, 50 institutes from geography and sociology departments at German-speaking universities were contacted. However, due to low response rates, only 12 German-language dissertations, 4 bachelor theses, 5 master theses, and 4 diploma theses could be identified.

Combining the results of the qualification papers and Web of Science keyword searches resulted in a literature database of 195 peer-reviewed and 31 non-peer-reviewed papers.

A further analysis distinguished the extent to which the papers examined dealt with the phase model. Of the initial 4262 international articles on gentrification, approximately 5% (203 articles) mentioned the phase model introduced by CLAY (1979) and further developed by DANGSCHAT (1988), or aspects of it. Of the 195 peer-reviewed articles, only 56 actually dealt with the examined phase model. The model was comprehensively reviewed in only three papers. Most papers that referred to the model focused on specific aspects rather than the whole. Of the 32 non-peer-reviewed papers, three of the four bachelor's theses, three of the five master's theses, all four diploma theses, and four of the twelve doctoral theses dealt in some way with phase models of gentrification, but no empirical studies of the model were found.

As a preliminary result of this staged research, it can be concluded that out of the 4262 academic papers written in English or German over the last 40 years, a total of 69 papers (56 peer-reviewed, 13 qualification papers), deal more intensively with the phase model of gentrification according to CLAY (1979) and DANGSCHAT (1988), representing just under 2%. These articles were then subjected to a more detailed qualitative content analysis, the results of which are presented below.

A limitation of this approach is that we can only include those papers that explicitly refer to the phase models or central aspects of the phase models. The papers that implicitly embed these models cannot be considered. Therefore, we have no estimate of the number of papers in which there is an implicit mention of the models that we do not consider. However, since the data base for our research is quite extensive, and the focus of our paper is on those papers where the models form a consistent basis for empirical work, we should be able to reasonably represent the scientific discourse on these models.

3.2 Results

The debate on the phase model of gentrification in German-language discourse has been mainly influenced by the work of the 'Hamburg Cluster,' around Friedrichs, Dangschat, and Blasisus, since the late 1980s (FRIEDRICHS 1996). Their work explicitly refers to the theories of neighbourhood change of the Chicago School (ÜBLACKER 2015). Central to this discourse are DANGSCHAT'S (1988) double invasion-succession cycle and FRIEDRICHS' (1996) four-phase model. As noted above, DANGSCHAT'S (1988) phase model of gentrification is a further development of the invasion-succession cycle model originally formulated in gentrification research by CLAY (1979). The core hypothesis of an invasion-succession cycle model is that a new group (B) invades a residential area predominantly occupied by another group (A) and gradually displaces it. However, DANGSCHAT (1988) proposed two successive invading groups—pioneers and gentrifiers—thereby developing CLAY'S model into a double invasion-succession cycle (FRIEDRICHS 1996). FRIEDRICHS recognises DANGSCHAT'S work as the first to distinctly categorise the groups involved in the gentrification process. Unlike CLAY, who saw the pioneers as a subtype of the more risk-taking gentrifiers, DANGSCHAT makes a clear distinction between these two groups. The problem, however, is that DANGSCHAT did not provide sufficient empirical support for this distinction when he developed his model. According to FRIEDRICHS (1996), earlier studies (DEGIOVANNI 1983, KERSTEIN 1990) had already cast considerable doubt on the empiric validity of the cycles identified by DANGSCHAT. This also highlights methodological challenges of validating the model in older German studies (ALISCH & DANGSCHAT 1996).

The development and application of DANGSCHAT'S (1988) model of the double invasion-succession cycle has been limited to the German-speaking countries. This was largely due to the limited interaction between German and English-language gentrification research following the further development of CLAY'S (1979) model (GLATTER 2007). According to HOLM (2012), significant empirically oriented case studies in the 1990s were published mainly in Hamburg, Cologne, and Frankfurt am Main. Although there were attempts to test the model empirically (DANGSCHAT 1991, DANGSCHAT & ALISCH 1996), it could not be verified due to methodological difficulties.

FRIEDRICHS (1996) identified several methodological challenges in the study of gentrification. First, the model had never been tested using panel

data. The data used were always cross-sectional, representing conditions at one point in time. The course of the gentrification process therefore had to be estimated using retrospective questions in a cross-sectional study, which is an inadequate empirical test of the original hypothesis. This problem of lack of data availability, has been a recurring theme in most German-language gentrification studies, as noted by GLATTER, due to the immense effort required to construct a panel dataset using individual methods. Key gentrification indicators related to individuals and households, as well as other descriptive and explanatory characteristics, would have to be collected through survey over several years (GLATTER 2007: 46). ÜBLACKER (2017) reinforces this point, noting that research on the process of gentrification has predominantly relied on cross-sectional studies, a situation that ECKARDT (2018) also attributes to the lack of detailed panel data.

The second problem arises from the definition of the groups involved in the process. A household identified as a pioneer at one point may later be categorised as a gentrifier due to changes in income or other defining characteristics (FRIEDRICHS 1996: 17). The number of gentrifiers therefore does not increase as a result of people moving in, but as a result of a change in group membership. This assumption is confirmed by HOCHSTENBACH & VAN GENT (2015), who identify ageing as one of the main reasons for structural change. For studies conducted up until the late 1990s, FRIEDRICHS (1996) notes that the empirical evidence suggests that the processes in question are not continuous but discontinuous. He concludes that, as of that time, there is no empirically sustainable theory of the gentrification process. Although phase models of the process have high heuristic value, their complexity makes them difficult to test empirically. FRIEDRICHS identifies a key research need in the creation of time series for selected variables such as building sales prices, land values, building upgrades, rent levels, income, and household age. This data collection should not only cover residential areas where gentrification is suspected, but should be extended to all urban residential areas. He argues that this approach would enable researchers to distinguish specific changes in particular urban sub-areas from those occurring universally (FRIEDRICHS 1996: 39).

In the years that followed, the limited number of studies that examined the model produced ambiguous results. For example, in some areas, gentrification processes were observed without the presence of pioneers, while in other cases, the so-called

pioneers seemed to follow the gentrifiers, at least during certain phases (KELLERMAN 2006). Other studies, such as FABULA et al. (2017), conclude that gentrification and studentification (which can be compared to the pioneer phase) do not occur sequentially, but rather in parallel.

In the late 1990s and 2000s, German gentrification research focused primarily on urban development processes in East German cities (e.g. GLATTER 2007, HARTH et al. 1998, THOMAS et al. 2008, WEIST 2006). In many of these studies, the phase model was often only briefly mentioned, or certain phases or basic assumptions of the model were confirmed or refuted, without actually using the model as a theoretical framework. Even in studies that applied and modestly extended the categories and scales of the model (BERNT et al. 2010), the central methodological issue of relying on cross-sectional studies, mainly due to the lack of detailed panel data, remained unaddressed (ÜBLACKER 2017). As a result, ECKARDT (2018: 26) concluded that gentrification research based on the phase model had reached a dead end by the 2000s. Similarly, BERNT et al. (2010) and HOLM (2012) assessed the explanatory power of the phase model as very limited, noting that it depicted only one possible course of gentrification (ÜBLACKER 2015).

A few years later, however, the studies by BLASIUS & FRIEDRICHS (2016) and BLASIUS et al. (2016) were the first real attempts at empirical verification and further development of the model, taking into account the validation requirements outlined by FRIEDRICHS in 1996 (DILLER 2017). These studies included not only demand-side but also economic, supply-side indicators. Crucially, the research was structured as a panel study. For the areas 'suspected of gentrification,' a random sample of 2,500 individuals was selected. During the first wave of the study in 2010, 1009 interviews were conducted. In the second wave in 2011, 878 of the 1009 apartments were interviewed, and in the third wave in 2013, 810 interviews were conducted. A key aspect of this study was that the unit of analysis was the apartment, not the individual. BLASIUS et al. (2016) argue that this approach allows for the observation of changes in households (both tenants and homeowners), fluctuations in rents and purchase prices, and the conversion of rented apartments into owner-occupied units. Although the time series of this study only covers three years, it is closer to the requirements of FRIEDRICHS (1996). However, it did not establish control values for the whole city.

Looking at the results of BLASIUS et al. (2016), as shown in Figure 4, it is striking that in both Mühlheim and Deutz, at least two-thirds of the households surveyed were categorized as ‘other’ and ‘elderly.’ Even at the end of the final phase, these groups remained the most frequent segments of the population. The three groups identified as key to gentrification – pioneers, early gentrifiers, and late gentrifiers – showed little change in their overall share throughout the entire process. Consistent with the central phase model, two observations are noteworthy: first, the steady decline of the ‘others’ up to the age of 65 in both districts. Secondly, in Deutz, there is a discernible pattern of a slight decrease in pioneers, a decrease in early gentrifiers, and an increase in late gentrifiers, which is generally consistent with the basic model. However, the results for Mühlheim are less clear. For example, in the second wave, the share of established gentri-

ers decreased while the share of pioneers increased, which contradicts the expected model progression.

The authors believe that the phase model has proved its usefulness in showing that the two areas studied are at different stages of gentrification. In particular, the expected initial wave of pioneers was not observed in either area during the study period. The authors suggest that the gentrification process began in Deutz around 1995 and in Mühlheim around 2005, but their data does not strongly support this assumption. Instead, they found that in both areas, gentrifiers tend to reside longer than pioneers. This observation builds on FRIEDRICH’S (1996) discussion of in-situ gentrification, as shown in Figure 2, which posits that a household initially classified as a pioneer may later be reclassified as a gentrifier, possibly due to an increase in income. BLASIUS et al. (2016) see their study as the first empirical validation of this concept. However, given

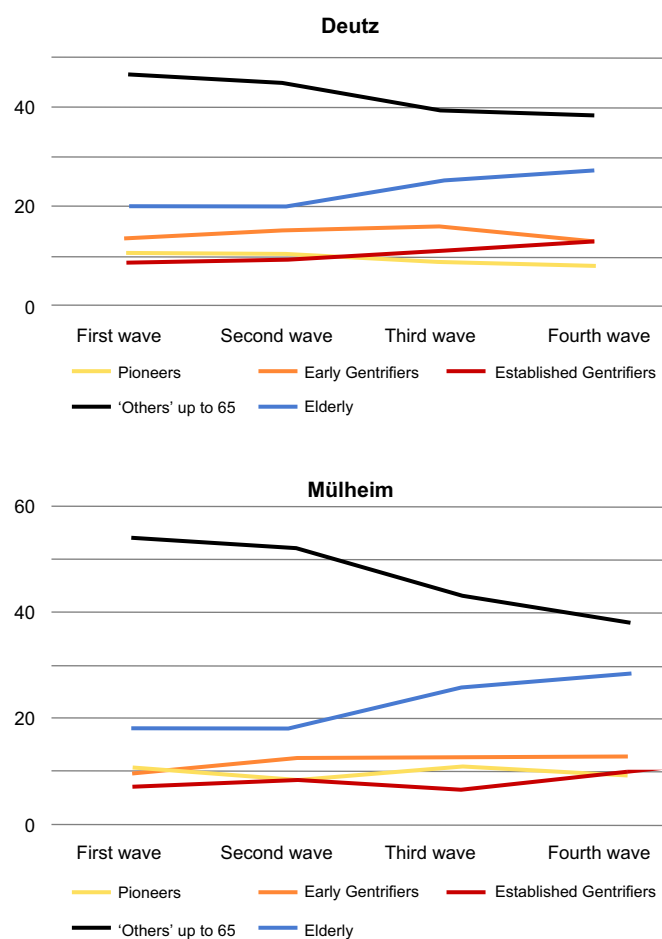


Fig. 4: Population group changes in the Cologne districts of Deutz and Mühlheim (results of a panel survey). Source: FRIEDRICH & BLASIUS (2016)

the relatively small number of households identified as pioneers or gentrifiers, the decline in the number of respondents over time, and the minimal change in the proportion of pioneers, this conclusion requires further scrutiny. The authors also claim that the number of pioneers decreases over time, while the number of established gentrifiers increases. However, their data only clearly supports this trend in the district of Deutz.

In summary, BLASIUS et al. 2016 conclude that most of the hypotheses derived from the phase model have been proven. However, in light of the preceding explanations, the extent to which this conclusion is really based on clear empirical evidence, rather than indirect indications, must be questioned. When the data are interpreted in terms of the actual developmental trends in the areas, the increasingly prominent phenomenon of an ageing population from the second phase onwards emerges as a more striking finding than changes within the supposed core groups of gentrification. This aspect of ageing, irrespective of income and social status, is not addressed in the classic gentrification model. This raises the fundamental question of why gentrification is studied in isolation as a developmental characteristic of neighbourhood change, and whether, as FRIEDRICHS already suggested in 1996, the gentrification debate should not be embedded more strongly in the debate on neighbourhood transformation.

4 Discussion and perspectives

The basis of this study is the observation that phase models of gentrification, in particular DANGSCHAT'S (1988) double invasion-succession cycle model, which builds on CLAY'S (1979) work and notably distinguishes between pioneers and gentrifiers as key population groups, are fundamental components of German-language school textbooks. These models are prominent in urban geography and urban sociology education. Through the juxtaposition of population groups and its presumed quantitative accuracy and potential for predictive interpretation, this model is highly descriptive and relevant to real-world applications, thus potentially influencing local gentrification discourses.

One would expect such a model to be based on robust academic research. However, a comprehensive international review of research papers on gentrification from the past 40 years, supplemented by a search of qualification papers at German-

speaking universities, found that only a small proportion – around 5% – even mention CLAY'S (1979) and DANGSCHAT'S (1988) phase model. Of the more than 4,000 works on gentrification researched worldwide, only about 2% deal with this model in any depth, in marked contrast to the extensive coverage it receives in most German-language geography textbooks.

An evaluation of the studies that have looked more closely at DANGSCHAT'S (1988) model shows that the model has at best been partially confirmed, but not in its entirety. This finding is particularly remarkable given that CLAY'S phase model, which does not systematically distinguish between gentrifiers and pioneers, has been empirically validated (e.g., FRIEDRICHS 1996, THOMAS 2008). As early as 1996, FRIEDRICHS identified methodological challenges to the validation and further development of the model, in particular the lack of panel studies with precise group operationalisation and comparative observations over time. Surprisingly, these issues were not adequately addressed in German-language research for a long time. Although gentrification research in Germany intensified in the 2000s, the model's importance in academic discourse declined – paradoxically, just as it was gaining ground in textbooks. It was not until the research projects in two Cologne districts by BLASIUS et al. (2016) and BLASIUS & FRIEDRICHS (2016), which included a three-year panel study, that these issues were addressed more fundamentally. While these studies provided selective evidence in support of the model, their overall findings suggest that the textbook-formulated phase model, with its sequence of pioneers and gentrifiers, can be seen as a potential type of gentrification trajectory, but cannot be generalised as 'the' phase model of gentrification. This finding confirms previously formulated criticisms (FRIEDRICHS 1996, ADAM & STURM 2014, ECKARDT 2018, GLATTER 2007, JENSEN & SCHIPPER 2018, THOMAS 2008).

This raises questions about the usefulness of demand-side phase models in gentrification research. Is further research worthwhile? To answer this question, we first address some of the criticisms of the phase model that have been formulated by academics:

Undercomplexity, oversimplification: General criticisms of phase models point to their tendency towards oversimplification (SWANSTROM & PLÖGER 2022, WIEST & ZISCHNER 2006, ZHAO 2019, ECKARDT 2018). It is important to recognise that models are simplifications of reality and cannot

capture all aspects of a phenomenon simultaneously. Progression models aim to depict the most likely trajectory, without excluding the possibility of alternate trajectories, such as policy interventions in gentrification processes. However, empirical evidence to date suggests that the phase model does not represent the general course of gentrification, nor does it represent the most likely course of the process in terms of strict statistical probabilities.

Neglect of key aspects of gentrification: The supply-side aspects that are central to the process of gentrification, such as ownership structures and the underlying real estate aspects that increasingly need to be considered from a global perspective, are not sufficiently illuminated by the socio-cultural perspective of the phase models (JENSEN & SCHIPPER 2018). Although the model never aimed to provide a comprehensive theory of gentrification by focusing only on the socio-cultural aspects of the demand side, a complete definition of gentrification must include both economic and socio-cultural dimensions, closely linked to the symbolic dimension.

Reduction to quantifiable aspects: While the call since the 2000s for gentrification research to emphasise qualitative research (ECKARDT 2018) is valid, the value of quantitative empirical evidence should not be underestimated, especially in times of alternative facts in politically and emotionally charged debates. Given the information gaps on socio-cultural aspects in current official statistics and the resulting high costs of primary surveys, quantitative empirical evidence should always be pursued. However, representations such as those in the above-mentioned textbooks with supposedly exact information on the proportions of population groups (Fig. 1), which are not only not confirmed by the facts, but even refuted, appear problematic: in terms of their share of the population, pioneers and gentrifiers do not have the significance that the model suggests, even in areas undergoing gentrification; there can be no talk of dominance at all. Nevertheless, they often function primarily as bearers of meaning and thus have a greater significance for the discourses and real developments in such areas than their share of the population would suggest.

Further investigation of the scientific trajectory of DANGSCHAT'S (1988) phase model of gentrification raises fundamental questions about the transformation of knowledge within the scientific system and its transfer to other systems such as school education. Within the academic community, the findings highlight shortcomings in urban sociology/urban geography research. Despite the original

inspiration from English-language gentrification research, there has been no significant international debate on this or other phase models, concerning aspects such as validity and generalisability. However, concise phase models would certainly have the potential for a competition of empirical research on the most valid model. More worrying is the 20-year delay in addressing the complex but feasible methodological requirements for testing the model, finally realised in a DFG-funded research project. The German-speaking research community appeared to lack the unity, continuity, or critical mass necessary to mobilise appropriate resources for such open research questions.

The phase model of gentrification as formulated by DANGSCHAT (1988) has outlived its usefulness. Despite its limitations, it can still provide a basis for examining demand-side aspects of gentrification research. The following aspects appear to be useful:

Types of progression rather than a generalizing model and further differentiation of social groups: The aforementioned study by BLASISUS et al. (2016) makes it clear, as already noted by FRIEDRICHS in 1996, that the issue of gentrification should be more strongly embedded in general socio-ecological debates on the transformation of neighbourhoods and also the associated social inequalities (KÜNSTLER & SCHIPPER 2021), in particular displacement processes (BERAN & NUISSL 2019), and the associated political disputes (SCHIPPER & LATOCHA 2022). However, other population groups than the pioneers and gentrifiers also play a role in these transformation processes. The more recent studies for Cologne (BLASISUS et al. 2016) show that the model group of "others" requires greater differentiation. A central feature of neighbourhood change is, to put it bluntly, ageing: 'gentrification' goes hand in hand with 'gerontification'. Aspects of ethnicity have also been largely ignored in the gentrification debate, which has focused on the phase model; however, there are close links to segregation research here, which should be included in the gentrification debate. Issues of gender (CURRAN 2018) and multi-local lifestyles (HILTI 2020) can also be of interest when analysing neighbourhood change. The gentrification debate is more closely linked to the housing policy debate than ever before (SCHIPPER & VOLMER 2020). While this is to be regretted, it has contributed to an increasing blurring of the concept of gentrification - especially in the context of a now highly globalised debate (LEES et al. 2022): Compared to the 1980s and 1990s, when, at least in Germany, the gentri-

fication debate was exclusively linked to changes in the population structure of neighbourhoods in the context of real estate upgrading processes, aspects of changes in the functions of areas, such as changes in the structure of tradespeople, are now also seen as a dimension of gentrification (VOSS 2016, HUBBARD 2018). Terms such as studentification (ANDERSON 2024) and touristification (OJEDA & KIEFFER 2020) are also closely linked to the concept of gentrification. In a cyclical model reduced to a few variables of the resident structure, these aspects of the neighbourhood transformation, some of which are likely to be closely linked, are difficult to capture; more sophisticated typifications might be more helpful here.

In this context, of course, quantitative studies of the dynamics continue to be of great importance. However, it can be assumed that the double invasion-succession cycle with the gradual dominance of pioneers and gentrifiers, is probably only one type of gentrification trajectory, a hypothesis that could be tested in comparative studies. Although the double invasion-succession cycle formulated by DANGSCHAT is not sufficiently valid as a generalisable model, it would still be a step backwards for gentrification research to revert to CLAY'S (1979) model and to dispense with further differentiation of the population groups relevant to the process. On the contrary, research on recently discussed phenomena such as super-gentrification requires an advanced differentiation according to social status groups and possibly also ethnic groups (FRANK 2018). Such phenomena are treated in the media - also with parodic features ("billionaires displace millionaires") - at least with a high entertainment value. For future gentrification research, it is certainly promising to identify further possible types of progression, i.e. to develop a progression typology, through comparative studies based on a large number of cases. The criticism of the phase model's rigid definitions of population groups cannot be completely dispelled, but the inclusion of additional characteristics from empirical lifestyle research (e.g., RÖSSEL & HOELSCHER 2012) might lead to more nuanced results, recognising the existence of mixed forms between pioneers and gentrifiers in a temporal development dynamic.

Improving the efficiency of empirical surveys: Methodologically, panel surveys remain essential, ideally focusing on individual apartments as the smallest unit of investigation and including contrasting neighbourhoods within one or more cities.

This resource-intensive approach could be offset by integrating questions of gentrification into other research areas such as migration, segregation, ageing, and lifestyle studies. In such a broader context, it would also be useful to include the central gentrification issue of displacement, which is deliberately not explored further in this article, although it is central to the processes underlying the model, especially in public discourse. A recent empirical study in Berlin's urban districts, for the first time in German-speaking countries, has comprehensively addressed different forms of displacement and their political implications in gentrification developments, by asking people who had moved away from areas about their motives for leaving (BERAN & NUISSL 2019).

Improved knowledge transfer between research and school education: The study also revealed gaps in knowledge transfer between urban sociology/urban geography research and school didactics. While only parts of the research of a discipline can be incorporated into school curricula, the conciseness of the phase model makes it particularly suitable for addressing gentrification in education. The heuristic value of the model is undisputed despite the lack of empirical evidence. The polarised development of individual population groups in the model encourages people to make references to their own living environments. Nevertheless, it is doubtful whether the model can be generalised. It would therefore be helpful at least to have clearer references to the limitations of the model in the teaching materials. The authors of textbooks should be asked to soften the supposedly exact model statements in the presentation: for example, by not labelling the y-axis at all or by presenting the population shares of the individual groups in a way that corresponds to the real population shares. In particular, the approach, already suggested in some textbooks, of presenting different types of progression rather than a single model seems promising. In order to improve such aspects, better integration of research and school education would be an important prerequisite. Geographical institutes and universities, which often house both subject-specific and didactic working groups, have considerable potential in this respect.

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